

**RADIOLOGICAL EFFLUENTS RELEASED  
FROM U.S. CONTINENTAL TESTS  
1961 THROUGH 1992**



AUGUST 1996

**UNITED STATES DEPARTMENT OF ENERGY  
NEVADA OPERATIONS OFFICE**

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**RADIOLOGICAL EFFLUENTS RELEASED FROM  
U.S. CONTINENTAL TESTS 1961 THROUGH 1992**

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## ABSTRACT

This report documents all continental tests from September 15, 1961, through September 23, 1992, from which radioactive effluents were released. The report includes both updated information previously published in the publicly available May 1990 report, DOE/NV-317, Radiological Effluents Released from Announced U.S. Continental Tests 1961 through 1988, and effluent release information on formerly unannounced tests.

General information provided for each test includes the date, time, location, type of test, sponsoring laboratory and/or agency or other sponsor, depth of burial, purpose, yield or yield range, extent of the release (onsite only or offsite), and category of release (detonation-time versus posttest operations). Where a test with simultaneous detonations is listed, location, depth of burial and yield information are given for each detonation if applicable, as well as the specific source of the release, if available.

A summary of each release incident by type of release is included. For a detonation-time release, the effluent curies are expressed at R+12 hours. For controlled releases from tunnel tests, the effluent curies are expressed at both time of release and at R+12 hours, if available. All other types are listed at the time of the release. In addition, a qualitative statement of the isotopes in the effluent is included for detonation-time and controlled releases, if available, and a quantitative listing is included for all other types.

Offsite release information includes the cloud direction, the maximum activity detected in the air offsite, the maximum gamma exposure rate detected offsite, the maximum iodine level detected offsite, and the maximum distance radiation was detected offsite. An explanation of how these categories are defined (for the purpose of this report) is found in the introductory text.

A release summary includes whatever other pertinent information is available for each release incident. This document includes effluent release information for 433 tests, some of which have simultaneous detonations. However, only 52 of these are designated as having offsite releases.

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## INTRODUCTION

In May 1990, the U.S. Department of Energy (DOE) published the report Radiological Effluents Released from Announced U.S. Continental Tests, 1961 through 1988 (DOE/NV-317). The purpose of that report was to inform the public of all releases of radioactive effluent associated with the U.S. underground nuclear testing program. At that time, not all underground nuclear tests and none of the simultaneous detonations had been announced to the public; therefore, those release data could not be published.

In December 1993 and June 1994, the Secretary of Energy declassified information related to previously unannounced nuclear weapons tests and simultaneous detonations associated with nuclear weapons tests. This information also provided the definition (in language of the Threshold Test Ban Treaty) of a nuclear test conducted at the Nevada Test Site (NTS), and therefore differentiated a detonation from a test. A detonation is a single nuclear explosion, while a test can be a single or multiple nuclear explosion where specific parameters are defined in the treaty. The complete definitions are found in the Glossary of this report.

This revision of DOE/NV-317 provides information on the radiological releases of the previously unannounced tests and simultaneous detonations. In some instances, information has been updated for previously announced tests that had simultaneous detonations. Thirteen additional previously announced tests, not included in the May 1990 report, were determined to have released effluents upon further review of test data by the sponsoring laboratory. These tests have been included in this revision.

## HISTORICAL AND BACKGROUND INFORMATION

The United States began testing nuclear explosive devices on July 16, 1945, near Alamogordo, New Mexico. Following the conclusion of World War II, the U.S. initiated several test series in the Pacific and, beginning in 1951, in the continental U.S. The U.S. entered into a unilateral testing moratorium on October 1, 1958. On September 15, 1961, the U.S. resumed testing. Prior to the moratorium, the majority of tests were conducted in the atmosphere. Following the resumption of U.S. nuclear testing, 824 nuclear tests have been conducted within the boundaries of the U.S. Most of these tests were detonated underground with the anticipation that radioactivity generated by these tests would be totally or largely contained within the earth's surface. This report describes all tests since 1961 that released radioactive effluent into the atmosphere. A compilation of all U.S. nuclear tests is contained in DOE/NV-209 (Rev. 14) United States Nuclear Tests, July 1945 through September 1992.

In 1992, the U.S. Congress imposed a moratorium on nuclear testing that has been maintained by the President. There have not been any nuclear tests conducted by the U.S. since September 1992. This report is a complete documentation of radioactive releases resulting from nuclear tests in the continental U.S. from 1961 through September 1992. Radioactive releases from underground nuclear tests prior to 1961 were insignificant when compared to the radioactivity released from atmospheric tests during that time period.

## **TEST RELEASE CATEGORIES**

From September 15, 1961, through September 23, 1992, the DOE and its predecessor agencies conducted 824 nuclear tests at the NTS and other U.S. continental locations. All the tests were conducted underground except for those that were surface or near-surface tests. These included Plowshare cratering tests, Department of Defense (DoD) tests (Operation Sunbeam and others), and storage-transportation tests (Operation Roller Coaster).

During the period of nuclear testing before the Limited Test Ban Treaty (LTBT) was signed (i.e., from September 15, 1961, to August 5, 1963), no specific test containment design criteria existed. Therefore, while radioactive effluents released from underground tests conducted during this period were not always expected, any effluent releases that did occur were not considered accidental, or even unexpected. After August 5, 1963, when the LTBT was signed and design criteria had been formally established, all tests (except four Plowshare cratering tests) were designed to be completely contained underground. Of these 723 tests, only 105 were actual failures of containment design. Operational releases, such as those identified as controlled, drillback, gas sampling, mudpit or from cementback operations, occurred from 287 tests that included simultaneous detonations. There were also 32 operational releases from pre-LTBT tests. There were another five tests where late-time seepage occurred; these releases were considered neither accidental nor operational. Figure 1 shows a breakdown of the post-LTBT release categories. The numbers assigned to each of these categories account for multiple releases from some tests, and also reflect the numbers and categories from simultaneous detonations. The numbers also reflect the removal of one test (HAVARTI) that was reported in the initial DOE/NV-317 report published in May 1990. Upon further review by sponsoring-laboratory personnel, it was determined that no effluent was released from this test.

Very few of the tests or simultaneous detonations resulted in particulate release with accompanying fallout of radioactive material, and only 52 (i.e., 6.3 percent of the 824 tests conducted in this period) released radioactivity that was detected by ground or aerial measurements made offsite. This document summarizes each of those 433 tests, some of which have simultaneous detonations, where any type of release was detected. Figure 2 shows the offsite versus onsite release information.

## **RADIATION MONITORING**

### Onsite

For every test, ground monitoring onsite was performed by the laboratory or agency conducting the test. These include Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), Sandia National Laboratories (SNL), or the Defense Nuclear Agency (DNA) that is the testing organization within the DoD. In addition, Reynolds Electrical & Engineering Company, Incorporated (REECo), the onsite radiological support contractor, was responsible for operating the onsite monitoring equipment for every test.

For each test, radiation measurements began milliseconds after detonation, and continued until no apparent radiation hazard existed. If a release of radioactivity occurred, the first indications

of the occurrence, including the extent of the release and the direction the effluent was moving, were detections by the remote area monitoring system (RAMS). The RAMS consisted of an array of 30 to 40 permanent and a variable number of temporary (depending on the test) instrument stations that monitored gamma-ray exposure rates on the ground within the NTS.

Aerial monitoring was conducted onsite by REECo, the U.S. Air Force, the Environmental Protection Agency (EPA), and its predecessor, the Public Health Service (PHS). If a test release occurred, air support was available immediately to track the effluent in order to determine the size, radiation intensity levels, the rate of travel, and the trajectory of the cloud.

The onsite environmental monitoring program (where air, water, and external gamma exposure levels were constantly monitored) was conducted by REECo personnel. Air sample, thermoluminescent dosimeter (TLD), and water sample data were constantly analyzed to determine whether any increase in radiation levels occurred in a specific area because of delayed radiation releases.

### Offsite

The EPA (or PHS) conducted the offsite ground monitoring program using gamma rate recorders, film badges or TLDs, air samplers, and portable monitoring equipment.

A network of over 100 permanent monitoring stations was established to maintain a continuous record of total radiation exposures outside the NTS. In addition, mobile monitoring units were deployed in the field depending upon the test and whether the effluent cloud trajectory was anticipated to travel offsite. Milk and water sampling stations were also established within a 300-mile radius of the NTS.

Offsite aerial monitoring and tracking operations were coordinated with onsite monitoring activities. After a detonation occurred, if effluent was detected by aircraft monitoring instruments, the EPA (or PHS) and the EG&G/EM Nevada Aerial Tracking System (NATS) were responsible for tracking the cloud and determining radiation intensity levels until no measurable radioactive effluent was detected.

## **RELEASE DESCRIPTION AND CLASSIFICATION**

Each release has been categorized by type and has been defined for the purpose of this report. For some of the tests where multiple releases occurred, pertinent information on each release has been summarized, if available.

A "test" release (or an "uncontrolled" release for DoD tunnel tests) has been defined as a spontaneous release that occurred after a test but before postshot drilling operations began. This release definition also reflects the Containment Evaluation Panel (CEP) definition that states: "satisfactory containment will result in no radioactivity measurable offsite by normal monitoring equipment and no unanticipated release of radioactivity onsite." Therefore, test releases that did not meet the CEP definition were further categorized as pre-LTBT (i.e., before August 5, 1963), crater, surface, and near-surface tests. The pre-LTBT shaft and tunnel tests, where a sampling

conduit to the atmosphere was designed and placed in the test complex for sampling of the particulate matter released, have been defined as "test/prompt particle sampling" releases. The cratering Plowshare tests, where the test was designed to produce a throw-out of earth, have been designated as "test/crater" releases. Releases from surface tests have been categorized as "test/surface." Those surface and near-surface tests, that were non-nuclear tests designed to determine the extent of debris scattering, have been defined as "test/plutonium dispersal" releases. Test release quantity has been normalized to R+12 hours. This value represents the quantity of radioactive material remaining after decaying 12 hours from the time of release, and provides a measure of offsite exposure resulting from a radioactive release consisting of isotopes with widely varying half-lives. Values have been reported to two significant figures, and include a qualitative isotopic breakdown, if available.

"Controlled" releases were usually planned, filtered, tunnel-related releases. This type of postshot release was passed through a high efficiency, particulate air filter and charcoal filter combination where most of the particulates were removed from the escaping gases before these gases were vented from the tunnel into the atmosphere. Purgings of the tunnels was required because health and safety considerations prevented reentry into the test area until airborne radiation levels were such that exposure to personnel would be minimal. Controlled releases also occurred from shaft tests, but these were infrequent. These data, listed at both time of release and at R+12 hours, if available, and estimated to two significant figures, reflect the effluent curies released to the atmosphere through the tunnel ventilation system. A qualitative isotopic breakdown is reported, if available.

"Drillback" releases occurred during postshot drilling operations to recover samples; these releases were either filtered or unfiltered. After drillback operations were completed, a "cementback" occurred where the drill hole was sealed with a plug and cemented to the surface. Releases during cementback operations were monitored by air sampling equipment. These release data have been listed at the time of release, estimated from the point of release and reported to two significant figures, when possible. A quantitative isotopic breakdown is reported, if available.

"Gas sampling" releases occurred during gas sampling operations, either before or after any postshot drilling operations commenced, depending on specific test circumstances. In most instances, these were controlled releases occurring when a determination had been made to reduce the volume of gas accumulated in a sampling tank. However, gas sampling releases also could have occurred as a result of equipment failure or other unexpected developments. These data have been listed in the same manner as drillback release data.

"Late-time seepage" releases occurred when noble gases have leaked from test sites after all operations in the area have ceased. These late-time releases were documented through the air sampling program that continually monitors radiation levels. This form of release is addressed in the NTS Environmental Impact Statement and is an anticipated phenomenon. These data have been reported in the same manner as drillback release data.

## DATA FORMAT AND OFFSITE CATEGORY DESCRIPTIONS

The information listed below is given for each test in which a release occurred. However, for tests with simultaneous detonations, each individual detonation name, hole designation, depth of burial, and yield data are given, if applicable. If it is not known from which detonation the release occurred, all the detonation names that comprise the test are listed. Specific information includes the following items:

- The name, date, local time, and location (i.e., the Nevada Test Site or other continental locations, and the hole or tunnel designation).
- The type of test or simultaneous detonation (tunnel, shaft, crater, or surface).
- The extent of the release (i.e., whether the release was detected offsite or onsite only).

Special designation for onsite releases - Four tests, MINK, STOAT, HAYMAKER, and WICHITA, were designated to have had releases onsite only, even though after each of these tests, monitoring data indicated radioactivity in offsite areas. After further investigation, the DOE Test Authorities Liaison Office issued a memorandum on April 19, 1979, stating that these tests were not considered to have been detected offsite by the EPA. The reasoning for this determination was that at the time of these tests, weather data indicated that the prevailing wind directions made it extremely unlikely that radioactivity levels detected offsite were from any of these tests. More than likely, the source of the radioactivity detected was the result of foreign tests conducted during that time.

Qualitative onsite release data - Four tests, MAD, STILLWATER, CODSAW, and SACRAMENTO, are documented to have had "slight" test releases because monitoring techniques in use at that time did not provide quantitative release data. A reference document states that prior to October 1963, it is estimated that a total undetected release of up to 1,000 curies would be possible. This applies to volatiles and noble gases only, as undetected particulate releases would be much less. Subsequent to that time, undetected releases of up to five curies were possible.

- The laboratory and/or agency sponsoring the test. The acronym used denotes the name of the laboratory and/or agency at the time the test was conducted, i.e., LRL, LLL, LLNL, LASL, LANL, SC, SL, SNL, DoD, or laboratory acronym/UK. (See acronyms listing.)
- The depth of burial of the device(s).
- The purpose of the test or each of the detonations (i.e., weapons-related, weapons-effects, storage-transportation, Plowshare, Vela Uniform, safety experiment, or joint US-UK).
- The yield or yield range of the device(s), as listed in DOE/NV-209 (Rev. 14).

- The category of the release (i.e., test, operational [drillback, cementback, mudpit, and gas sampling], uncontrolled, controlled, late-time seepage, test/prompt particle sampling, test/crater, and test/surface).
- The data listed for releases detected offsite includes the following information, if available:

Isotopes identified in the release - a listing of the isotopes detected in the effluent released.

Cloud direction - the general direction and distance, if known, that EPA and/or NATS aircraft tracked the effluent cloud.

Maximum activity detected in air offsite - the geographical location and the data where the highest concentration of gross beta activity (expressed in picocuries per cubic meter of air; 1 picocurie =  $1 \times 10^{-12}$  curie) was detected. The samples were collected on air samplers (either at a permanent air sampling station or on a portable air sampler). These air samplers, strategically placed for a specific test, were fitted with glass fiber air filters and most had activated charcoal filters. Measurements were made at approximately one meter above ground level; this was considered to be the most accurate reading for a given location. Information is given for both populated and unpopulated areas, if available.

Maximum gamma exposure rate detected offsite - the geographical location and the data where the highest radiation exposure per unit of time was measured by a portable or stationary monitoring instrument. Measurements were made at approximately one meter above ground level.

Maximum iodine level detected offsite - the geographical location and the data where the highest concentration of iodine was measured in air by a monitoring instrument. The sample could have been collected on an air filter or an activated charcoal filter fitted on a permanent or mobile air sampler. Measurements were made at approximately one meter above ground level.

Maximum distance radiation detected offsite - the geographical location and the data at the greatest distance from the detonation where radiation was detected as measured by ground monitoring (i.e., radiation detection instruments, fallout trays, film badges, air samplers, or TLDs) or by aerial monitoring (i.e., data recorded on monitoring instruments in aircraft while tracking an effluent cloud).

- Quantitative isotopic information for operational releases, if available.
- A detailed release summary description, if available. This could include, but is not limited to, test venting information (both onsite and offsite); milk contamination as a result of fallout entering the food chain pathway (offsite); and operational postshot information (both onsite and offsite).
- Reference codes listed for each test identify information sources.

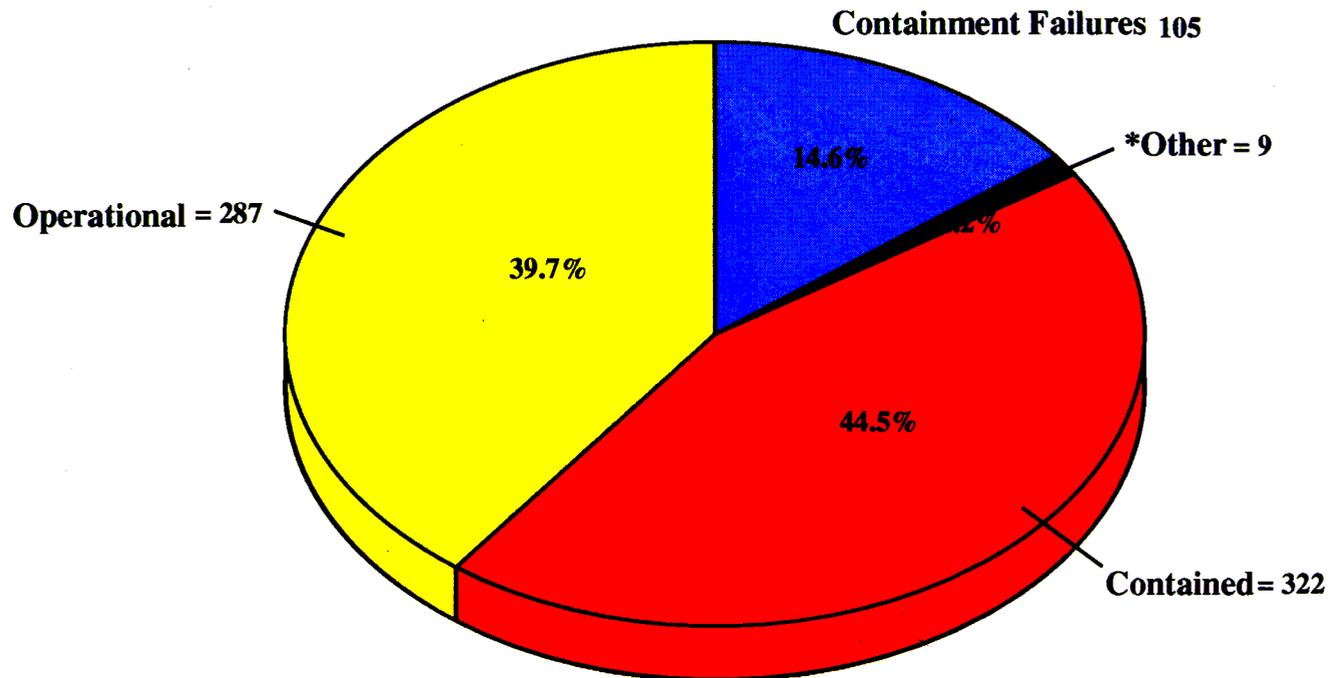
## **DOCUMENTATION**

This report was compiled from the best information currently available. It has been reviewed by health and safety personnel from the DOE Nevada Operations Office (DOE/NV), the national laboratories, the Environmental Monitoring Systems Laboratory of the EPA, and DNA. Sometimes there are discrepancies between information compiled at different times by different individuals in estimating the magnitude of radiological releases; reporting yields and yield ranges; and detecting effluent releases at offsite locations. Source documents do vary, and therefore, some data found in this report may not agree with other DOE-published test data. This report reflects data referenced in this document and represents the current consensus of opinion of the subject matter experts from the above-mentioned agencies/laboratories.

All references, designated by an alphanumeric coding system appearing after each test summary, are listed in reference code order following the tests section of the report. Those references that are publicly available are denoted by an asterisk (\*) following the citation. The classification of other references, if known, is denoted by the information within the brackets following the citation. All publicly available reference information can be obtained by contacting the DOE/NV Public Reading Facility, 2621 Losee Road, North Las Vegas, Nevada 89030. In addition, a glossary of terms, as they relate to this report, and a list of acronyms can be found after the reference information.

# RELEASE CATEGORIES FOR TESTS CONDUCTED AT THE NTS AND OTHER CONTINENTAL LOCATIONS AFTER THE LIMITED TEST BAN TREATY (LTBT)

Total Tests Conducted Post-LTBT = 723



\*Indicates late-time seepage and Plowshare/cratering

Figure 1. Release categories.

# TEST RELEASE - OFFSITE VERSUS ONSITE 1961 -1992

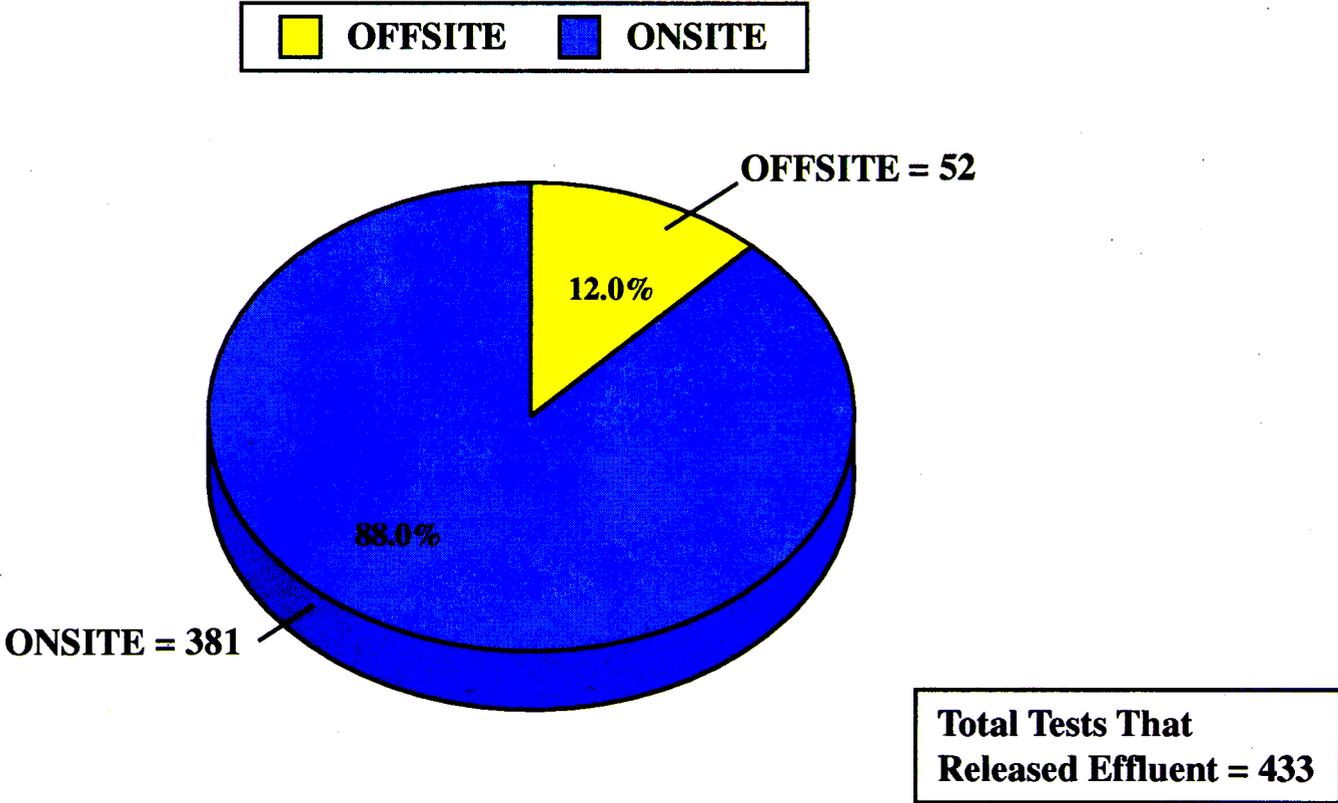


Figure 2. Offsite versus onsite releases.

<b>Test:</b>	<b>ANTLER</b>		
<b>Date:</b>	09/15/61	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	1,320 ft
<b>Location:</b>	NTS U12e.03	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	2.6 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $2.1 \times 10^5$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Northerly over Highway 25, Reed, Diablo, and Warm Springs, Nevada

**Maximum Activity Detected in Air Offsite:** 28 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 12.5 mR/h at Twin Springs Ranch, Nevada

**Maximum Iodine Level Detected Offsite:** 1.4 picocuries of  $^{131}\text{I}$  per cubic meter of air, 34 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 150 picocuries of  $^{135}\text{I}$  per cubic meter of air at Diablo, Nevada

**Maximum Distance Radiation Detected Offsite:** 1.5 mR/h at 21.1 miles northeast of the junction of Highway 6 and Highway 25 (Nevada)

---

**Release Summary:** Venting occurred at the tunnel portal at H+2 seconds and lasted for an unknown duration. A secondary steam explosion was observed from eight to ten minutes following the detonation.

---

**References:** (A) (C) (E) (F) (G) (H) (AY) (DA) (GA)

<b>Test:</b>	<b>SHREW</b>		
<b>Date:</b>	09/16/61	<b>Sponsor:</b>	LASL
<b>Time:</b>	1145 PST	<b>Depth of Burial:</b>	325 ft
<b>Location:</b>	NTS U3ac	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:** 4.9 -  $4.9 \times 10^2$  (estimated)

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**Release Summary:** This test released small visible quantities of radioactive steam and/or gases. The test release (probably from a sampling line) occurred before H+15 minutes and lasted for approximately two hours.

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**References:** (A) (B) (E) (F) (H) (J) (AY) (DA)

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**Test: BOOMER**

<b>Date:</b>	10/01/61	<b>Sponsor:</b>	LASL
<b>Time:</b>	1330 PST	<b>Depth of Burial:</b>	330 ft
<b>Location:</b>	NTS U3aa	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $2.5 \times 10^1 - 2.5 \times 10^3$  (estimated)

---

**Release Summary:** A test release occurred at H+12 hours from the sampling line area. Small amounts of noble gas daughters were seen on 50-foot arc samplers and from samples taken by monitoring aircraft.

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**References:** (B) (E) (H) (J) (AY)

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**Test: CHENA**

<b>Date:</b>	10/10/61	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	840 ft
<b>Location:</b>	NTS U12b.09	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $7.6 \times 10^2$

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**Release Summary:** Venting occurred at the tunnel portal at H+2 seconds and continued for approximately 20 minutes.

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**References:** (A) (C) (E) (F) (H) (AY) (DA) (G1)

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**Test: MINK**

<b>Date:</b>	10/29/61	<b>Sponsor:</b>	LASL
<b>Time:</b>	1030 PST	<b>Depth of Burial:</b>	630 ft
<b>Location:</b>	NTS U3ae	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only*	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours:** Slight

**Isotopes Identified in the Release:**  $^{131}\text{I}$ \*

**Cloud Direction:** Southerly

**Maximum Activity Detected in Air Offsite:** 13 picocuries of gross beta activity per cubic meter of air at Indian Springs, Nevada\*\*

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were measured.

**Maximum Iodine Level Detected Offsite:** 720 picocuries of  $^{131}\text{I}$  per liter in milk at Hiko, Nevada\*\*

**Maximum Distance Radiation Detected Offsite:** No radiation intensities above background levels were measured.

---

**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Some seepage was evident at H+25 minutes from the sampling line. Small amounts of noble gas daughters were seen on 50-foot arc air samplers, but no activity was detected from samples taken by monitoring aircraft.

Measurable contamination of offsite milk supplies was observed. Iodine-131 levels in milk at Hiko, Nevada, were 720 picocuries per liter four days after the test. Some radiation was detected in the areas surrounding surface ground zero from gaseous radioactivity released during postshot drilling. No radiation was detected off the NTS from postshot operations.

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**References:** (A) (B) (E) (F) (H) (N) (AY) (DA) (EA) (GB)

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\*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

\*\*This gross beta and iodine activity in the air and iodine-131 concentration in milk was attributed to Russian nuclear tests around the time of this test.

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<b>Test:</b>	<b>FISHER</b>		
<b>Date:</b>	12/03/61	<b>Sponsor:</b>	LASL
<b>Time:</b>	1504 PST	<b>Depth of Burial:</b>	1,200 ft
<b>Location:</b>	NTS U3ah	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	13.4 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

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**Test Release at R+12 Hours, in Curies:** Less than  $5.0 \times 10^{-2}$  (estimated)

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the area of a broken sampling line near surface ground zero at approximately H+7 minutes and lasted for about one to two hours.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (J) (AY) (DA)

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<b>Test:</b>	<b>GNOME</b>		
<b>Date:</b>	12/10/61	<b>Sponsor:</b>	LRL
<b>Time:</b>	1200 MST	<b>Depth of Burial:</b>	1,185 ft
<b>Location:</b>	Carlsbad, NM	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	3.0 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours:** Release not quantified

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{137}\text{Cs}$ ,  $^{140}\text{Ba}$ / $^{140}\text{La}$ , and noble gases

**Cloud Direction:** Northwesterly direction crossing over Highway 128 and Highway 31 (New Mexico)

**Maximum Activity Detected in Air Offsite:** 160 picocuries of gross beta activity per cubic meter of air at the IMCC Mine, New Mexico

**Maximum Gamma Exposure Rate Detected Offsite:** 1,400 mR/h at 3.5 miles west of the junction of Highway 31 and 128

**Maximum Iodine Level Detected Offsite:** Near Carlsbad, New Mexico, 1.7 picocuries of  $^{131}\text{I}$  per cubic meter of air, 18 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 3.5 picocuries of  $^{135}\text{I}$  per cubic meter of air at the IMCC Processing Plant

**Maximum Distance Radiation Detected Offsite:** 0.3 mR/h at Roswell, New Mexico

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**Release Summary:** Radiation was detected at the blast door near the bottom of the shaft less than one minute following the explosion and at the shaft collar three minutes and 40 seconds after the detonation. At approximately seven minutes after the detonation, gray smoke, steam, and associated radioactivity surged from the shaft opening. By 11 minutes following the explosion, copious quantities of steam were issuing from both shaft and ventilation lines. A large flow continued for about 30 minutes before gradually decreasing. A small flow was still detected the following day. The radioactive elements that vented through the shaft were volatiles and noble gases.

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**References:** (A) (E) (H) (AY) (DC)

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<b>Test:</b>	<b>MAD</b>		
<b>Date:</b>	12/13/61	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	600 ft
<b>Location:</b>	NTS U9a	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	500 tons
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours:** Slight

**Release Summary:** This test released small visible quantities of radioactive steam and/or gases. The test release occurred at H+20 minutes.

NOTE: See statement in explanatory information on "qualitative onsite release data."

**References:** (A) (C) (E) (F) (H) (AY) (DA)

<b>Test:</b>	<b>RINGTAIL</b>		
<b>Date:</b>	12/17/61	<b>Sponsor:</b>	LASL
<b>Time:</b>	0835 PST	<b>Depth of Burial:</b>	1,200 ft
<b>Location:</b>	NTS U3ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours, in Curies:** Less than  $1.0 \times 10^1$  (estimated)

**Release Summary:** This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the sampling line between H+7 and H+25 minutes.

**References:** (A) (B) (E) (F) (H) (J) (AY) (DA)

<b>Test:</b>	<b>FEATHER</b>		
<b>Date:</b>	12/22/61	<b>Sponsor:</b>	LRL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	812 ft
<b>Location:</b>	NTS U12b.08	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	150 tons
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours, in Curies:**  $3.8 \times 10^2$

**Isotopes Identified in the Release:**  $^{103}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{140}\text{La}$ , and  $^{141}\text{Ce}$

**Cloud Direction:** Southwesterly over Death Valley Junction, California

**Maximum Activity Detected in Air Offsite:** 440 picocuries of gross beta activity per cubic meter of air at Bettle's Farm, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.08 mR/h at Death Valley Junction, California

**Maximum Iodine Level Detected Offsite:** 290 picocuries of <sup>133</sup>I per cubic meter of air and 1,000 picocuries of <sup>135</sup>I per cubic meter of air at Bettle's Farm, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.01 mR/h at 1.5 miles west to one mile south of Death Valley Junction, California

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**Release Summary:** At H hour, a small cloud rose from the tunnel portal and vent pipes on top of the mesa and endured for 11 minutes.

Monitoring data showed the cloud traveled in a straight path on a heading of 190 degrees, passing just east of Carrara, Nevada. South of Carrara, the path changed to the southeast, passing over Death Valley Junction and eventually reaching Ash Meadows, Nevada.

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**References:** (A) (C) (E) (F) (G) (H) (AY) (DA) (GC)

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<b>Test:</b>	<b>STOAT</b>		
<b>Date:</b>	01/09/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	1,000 ft
<b>Location:</b>	NTS U3ap	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	5.1 kt
<b>Release Detected:</b>	Onsite Only*	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

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**Test Release at R+12 Hours, in Curies:** 7.7

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**Isotopes Identified in the Release:** Gaseous fission products

**Cloud Direction:** Southerly over Highway 95 (Nevada)

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were measured.

**Maximum Iodine Level Detected Offsite:** Trace of <sup>131</sup>I in the air sample at Lathrop Wells, Nevada\*

**Maximum Distance Radiation Detected Offsite:** By USPHS aircraft only over Highway 95, approximately 40 miles from surface ground zero\*

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**Drillback Release Activity at Time of Release:** Slight

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**Release Summary:** A test release occurred at collapse time and lasted for approximately one minute from the sampling line. No radiation levels above background were detected off the NTS in populated areas from radioactivity released by this detonation. Radiation was detected off the Nevada Test Site approximately 40 miles from surface ground zero along Highway 95.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (N) (AY) (DA) (GD)

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\*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

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<b>Test:</b>	<b>DORMOUSE</b>		
<b>Date:</b>	01/30/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	1,190 ft
<b>Location:</b>	NTS U3aq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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<b>Test:</b>	<b>STILLWATER</b>		
<b>Date:</b>	02/08/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	595 ft
<b>Location:</b>	NTS U9c	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	3.07 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release:** Slight

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**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

NOTE: See statement in explanatory information on "qualitative onsite release data."

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**References:** (A) (C) (E) (F) (H) (AY) (DA)

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**Test: ARMADILLO**

<b>Date:</b>	02/09/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	786 ft
<b>Location:</b>	NTS U3ar	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	7.1 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** Less than  $1.2 \times 10^2$  (estimated)

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** A test release occurred from the surface ground zero area at H+3 minutes and lasted for ten minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (J) (AY) (DA)

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**Test: HARDHAT**

<b>Date:</b>	02/15/62	<b>Sponsor:</b>	DoD/SC/LASL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	950 ft
<b>Location:</b>	NTS U15a	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	5.7 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours:** Late slight

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Seepage occurred through the tunnel stemming. Aircraft sampling from 1050 to 1230 hours PST on February 16, 1962, showed the presence of a cloud.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (L) (AY) (DA)

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**Test: CHINCHILLA**

<b>Date:</b>	02/19/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	492 ft
<b>Location:</b>	NTS U3ag	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	1.9 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** 2.0

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** A test release (probably from the sampling line) occurred at H+1 minute and lasted for four minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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**Test: CODSAW**

<b>Date:</b>	02/19/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0950 PST	<b>Depth of Burial:</b>	696 ft
<b>Location:</b>	NTS U9g	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours:** Slight

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**Release Summary:** No early venting was detected.

NOTE: See statement in explanatory information on "qualitative onsite release data."

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**References:** (A) (C) (E) (F) (H) (AY) (DA)

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**Test: CIMARRON**

<b>Date:</b>	02/23/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	1,000 ft
<b>Location:</b>	NTS U9h	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	11.9 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $7.5 \times 10^2$

$^{133}\text{Xe}$  in curies:  $7.5 \times 10^2$

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**Release Summary:** A drillback release from the postshot drill hole occurred on March 2, 1963, and lasted for 3.5 hours.

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**References:** (A) (C) (E) (F) (H) (AY) (DA)

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**Test:** **PLATYPUS**

<b>Date:</b>	02/24/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	190 ft
<b>Location:</b>	NTS U3ad	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours:** Slight

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**Release Summary:** A test release occurred from the surface ground zero area from H time until H+1 minute.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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**Test:** **PAMPAS**

<b>Date:</b>	03/01/62	<b>Sponsor:</b>	LASL/UK
<b>Time:</b>	1110 PST	<b>Depth of Burial:</b>	1,200 ft
<b>Location:</b>	NTS U3al	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	9.5 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $2.0 \times 10^3$

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**Isotopes Identified in the Release:**  $^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{140}\text{La}$ , and  $^{141}\text{Ce}$

**Cloud Direction:** Northeasterly over Highway 25 (Nevada)

**Maximum Activity Detected in Air Offsite:** 1,700 picocuries of gross beta activity per cubic meter of air at Penoyer, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.22 mR/h at Penoyer, Nevada

**Maximum Iodine Level Detected Offsite:** 9 picocuries of  $^{131}\text{I}$  per cubic meter of air, 220 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 350 picocuries of  $^{135}\text{I}$  per cubic meter of air at Gunderson's Ranch, Penoyer, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.08 mR/h at 17.7 miles north of Highway 25 in Sand Springs Valley, Nevada

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** A test release occurred from a broken sampling line at zero time and lasted for 20 minutes. The release of radioactivity occurred with winds from the south carrying the cloud north on about a ten degree trajectory.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (G) (H) (AY) (DA) (GE)

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<b>Test:</b>	<b>DANNY BOY</b>		
<b>Date:</b>	03/05/62	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1015 PST	<b>Depth of Burial:</b>	110 ft
<b>Location:</b>	NTS U18a	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Crater	<b>Yield:</b>	430 tons
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Crater

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**Test Release at R+12 Hours, in Curies:**  $8.5 \times 10^5$

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**Isotopes Identified in the Release:**  $^{91}\text{Sr}$ ,  $^{103}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Northerly over Highway 6, west of Warm Springs, Nevada

**Maximum Activity Detected in Air Offsite:** 1,000 picocuries of gross beta activity per cubic meter of air at Warm Springs, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 3.2 mR/h 17.7 miles west of Warm Springs, Nevada

**Maximum Iodine Level Detected Offsite:** 6.9 picocuries of  $^{131}\text{I}$  per cubic meter of air, 220 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 350 picocuries of  $^{135}\text{I}$  per cubic meter of air at Warm Springs, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.02 mR/h at Carver's Restaurant, Nevada

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**Release Summary:** A persistent cloud was produced during the blow out crater formation containing appreciable quantities of radioactivity associated with particulates. The total release, at the time of release, was  $1.4 \times 10^{10}$  curies.

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**References:** (A) (E) (F) (G) (H) (U) (V) (AY) (DA) (GE)

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**Test: ERMINE**

<b>Date:</b>	03/06/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	240 ft
<b>Location:</b>	NTS U3ab	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release: Some**

**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

**References:** (A) (B) (E) (F) (H) (AY) (DA)

**Test: BRAZOS**

<b>Date:</b>	03/08/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	841 ft
<b>Location:</b>	NTS U9d	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	8.4 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

**Test Release at R+12 Hours, in Curies:**  $1.1 \times 10^3$

**Drillback Release Activity at Time of Release, in Curies:**  $9.5 \times 10^3$

$^{133}\text{Xe}$  in curies:  $9.5 \times 10^3$

**Release Summary:** This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the Rad-chem pipe at H time and lasted for 38 minutes.

A drillback release from the postshot drill hole occurred on March 12, 1962, and lasted for approximately seven hours.

**References:** (A) (C) (E) (F) (H) (AY) (DA)

**Test: HOGNOSE**

<b>Date:</b>	03/15/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	800 ft
<b>Location:</b>	NTS U3ai	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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**Test: HOOSIC**

<b>Date:</b>	03/28/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	613 ft
<b>Location:</b>	NTS U9j	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	3.4 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^4$

$^{133}\text{Xe}$  in curies:  $1.0 \times 10^4$

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**Release Summary:** A drillback release occurred from a postshot drill hole on April 13, 1962, and lasted for four days.

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**References:** (A) (C) (E) (F) (H) (AY) (DA)

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**Test: CHINCHILLA II**

<b>Date:</b>	03/31/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	458 ft
<b>Location:</b>	NTS U3as	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** Less than  $1.0 \times 10^1$

---

**Drillback Release Activity at Time of Release:** Some

**Release Summary:** The test release occurred from the surface ground zero area at H+4 minutes and lasted for approximately 30 minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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<b>Test:</b>	<b>DORMOUSE PRIME</b>		
<b>Date:</b>	04/05/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	856 ft
<b>Location:</b>	NTS U3az	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	10.6 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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<b>Test:</b>	<b>PASSAIC</b>		
<b>Date:</b>	04/06/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	766 ft
<b>Location:</b>	NTS U91	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $6.0 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $6.0 \times 10^2$

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**Release Summary:** A drillback release occurred from a postshot drill hole on April 9, 1962, and lasted for approximately six hours.

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**References:** (A) (C) (E) (F) (H) (I) (AY) (DA)

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**Test: HUDSON**

<b>Date:</b>	04/12/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	480 ft
<b>Location:</b>	NTS U9n	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $5.0 \times 10^2$  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $5.0 \times 10^2$ **Release Summary:** A drillback release occurred from a postshot drill hole on April 16, 1962, and lasted for eight hours.**References:** (A) (C) (E) (F) (H) (AY) (DA)**Test: PLATTE**

<b>Date:</b>	04/14/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	560 ft
<b>Location:</b>	NTS U12k.01	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	1.85 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Test/Prompt Particle Sampling

**Test Release at R+12 Hours, in Curies:**  $1.9 \times 10^6$ **Isotopes Identified in the Release:**  $^{40}\text{K}$ ,  $^{95}\text{Zr}/^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ ,  $^{105}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{140}\text{Ba}/^{140}\text{La}$ ,  $^{141}\text{Ce}$ , and  $^{144}\text{Ce}$ **Cloud Direction:** Northerly over Highway 25 (Nevada) at a bearing of approximately 20 degrees**Maximum Activity Detected in Air Offsite:** 34,000 picocuries of gross beta activity per cubic meter of air at Queen City Summit, Nevada (unpopulated)**Maximum Gamma Exposure Rate Detected Offsite:** 47 mR/h at Queen City Summit, Nevada**Maximum Iodine Level Detected Offsite:** 3,500 picocuries of  $^{131}\text{I}$  per cubic meter of air, 23,000 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 37,000 picocuries of  $^{135}\text{I}$  per cubic meter of air at Queen City Summit, Nevada**Maximum Distance Radiation Detected Offsite:** 0.10 mR/h at 28.1 miles northeast of Currant, Nevada

**Release Summary:** Venting occurred at the tunnel portal, through fissures, and at the sampling hole at H+1.5 seconds. The fissures were created on the side of the hill, and radial cracks formed on top of the hill. A persistent cloud was produced containing appreciable quantities of radioactivity associated with particles.

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**References:** (A) (C) (E) (F) (G) (H) (AY) (DA) (GG)

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**Test:** **DEAD**

<b>Date:</b>	04/21/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1040 PST	<b>Depth of Burial:</b>	634 ft
<b>Location:</b>	NTS U9k	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^4$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $4.0 \times 10^4$

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**Release Summary:** A drillback release occurred from a postshot drill hole on April 23, 1962, and lasted for approximately 44 hours.

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**References:** (A) (C) (E) (F) (G) (H) (AY) (DA)

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**Test:** **BLACK**

<b>Date:</b>	04/27/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	714 ft
<b>Location:</b>	NTS U9p	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $1.5 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.5 \times 10^2$

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**Release Summary:** A drillback release occurred from a postshot drill hole on April 30, 1962, and lasted for approximately two hours.

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**References:** (A) (C) (E) (F) (H) (AY) (DA)

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<b>Test:</b>	<b>PACA</b>		
<b>Date:</b>	05/07/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1233 PDT	<b>Depth of Burial:</b>	848 ft
<b>Location:</b>	NTS U3ax	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:** Less than  $1.0 \times 10^1$

**Drillback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^5 - 1.0 \times 10^6$

**Release Summary:** A test release occurred from the surface ground zero area and lasted for less than two hours.

**References:** (A) (B) (E) (F) (H) (AY) (DA)

<b>Test:</b>	<b>ARIKAREE</b>		
<b>Date:</b>	05/10/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	547 ft
<b>Location:</b>	NTS U9r	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $2.0 \times 10^3$

**Release Summary:** A drillback release occurred from the postshot drill hole on May 11, 1962, and lasted for five hours.

**References:** (C) (E) (H) (AY)

<b>Test:</b>	<b>AARDVARK</b>		
<b>Date:</b>	05/12/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1200 PDT	<b>Depth of Burial:</b>	1,424 ft
<b>Location:</b>	NTS U3amS	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	40 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:** Less than  $1.0 \times 10^1$

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** A test release from cables occurred at H+105 minutes and lasted for approximately 45 minutes.

Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (DA)

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<b>Test:</b>	<b>EEL</b>		
<b>Date:</b>	05/19/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	714 ft
<b>Location:</b>	NTS U9m	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	4.5 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Prompt Particle Sampling

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**Test Release at R+12 Hours, in Curies:**  $1.9 \times 10^6$

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**Isotopes Identified in the Release:**  $^{95}\text{Zr}/^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ ,  $^{106}\text{Ru}$ ,  $^{105}\text{Rh}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{140}\text{Ba}/^{140}\text{La}$ ,  $^{141}\text{Ce}$ , and  $^{144}\text{Ce}$

**Cloud Direction:** Northerly towards Eureka, Nevada

**Maximum Activity Detected in Air Offsite:** 3,400 picocuries of gross beta activity per cubic meter of air at Currant, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 10 mR/h at 5.9 miles northwest of Queen City Summit, Nevada (unpopulated)

**Maximum Iodine Level Detected Offsite:** 5.6 picocuries of  $^{131}\text{I}$  per cubic meter of air, and 23 picocuries of  $^{133}\text{I}$  per cubic meter of air at Currant, Nevada, and 26 picocuries of  $^{135}\text{I}$  per cubic meter of air at Gunderson's Ranch, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.02 mR/h at 19 miles west of Ely, Nevada, on Highway 50

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**Release Summary:** Venting, in the form of a geyser, occurred at H+10 seconds from satellite hole U9m-2 and continued steadily until H+19 minutes, 42 seconds. A similar venting occurred at H+15 seconds from satellite hole U9m-3 and lasted until H+21 minutes. The venting ceased with crater subsidence.

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**References:** (A) (C) (E) (F) (G) (H) (AY) (CC) (DA) (GH)

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**Test: WHITE**

<b>Date:</b>	05/25/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	632 ft
<b>Location:</b>	NTS U9b	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.6 \times 10^3$

**Release Summary:** A drillback release occurred from the postshot drill hole on May 27, 1962, and lasted for eight hours.

**References:** (A) (C) (E) (F) (H) (AY) (DA)

**Test: PACKRAT**

<b>Date:</b>	06/06/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	860 ft
<b>Location:</b>	NTS U3aw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release:** Some

**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

**References:** (A) (B) (E) (F) (H) (AY) (DA)

**Test: DES MOINES**

<b>Date:</b>	06/13/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1400 PDT	<b>Depth of Burial:</b>	660 ft
<b>Location:</b>	NTS U12j.01	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	2.9 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Test/Prompt Particle Sampling

**Test Release at R+12 Hours, in Curies:**  $1.1 \times 10^7$

**Isotopes Identified in the Release:**  $^{103}\text{Ru}$ ,  $^{106}\text{Ru}/^{106}\text{Rh}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Generally northeasterly over Queen City Summit, Nevada (unpopulated)

**Maximum Activity Detected in Air Offsite:** 15,000 picocuries of gross beta activity per cubic meter of air at Queen City Summit, Nevada, (unpopulated), and 5,900 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 160 mR/h at Queen City Summit, Nevada

**Maximum Iodine Level Detected Offsite:** 1,400 picocuries of  $^{131}\text{I}$  per cubic meter of air, 16,000 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 230,000 picocuries of  $^{135}\text{I}$  per cubic meter of air at Queen City Summit, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.6 mR/h at 18.6 miles west of Ely, Nevada, on Highway 50 (approximately 163 miles from the detonation site)

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**Release Summary:** Venting began at H+0.2 seconds on top of the hill at surface ground zero, then from the sampling hole on the face of the hill, and finally through the portal. The duration of the release was approximately five minutes. The test vented out of the tunnel mouth with sufficient pressure and flow rate that radioactive debris was projected entirely across the canyon and deposited on the slope behind a trailer shelter.

The test caused  $^{131}\text{I}$  milk contamination in the following locations: Adavan, Nevada, 360 picocuries per liter on June 20; Elko, Nevada, 610 picocuries per liter on June 22; and Spokane, Washington, 1,200 picocuries per liter on June 20. All measurements were made from samples taken from fresh milk except those at Spokane that were made from pooled milk at a pasteurizing plant.

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**References:** (A) (C) (E) (F) (G) (H) (M) (AY) (DA) (GI)

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<b>Test:</b>	<b>DAMAN I</b>		
<b>Date:</b>	06/21/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	854 ft
<b>Location:</b>	NTS U3be	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (F) (H) (AY) (DA)

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<b>Test:</b>	<b>HAYMAKER</b>		
<b>Date:</b>	06/27/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1100 PDT	<b>Depth of Burial:</b>	1,340 ft
<b>Location:</b>	NTS U3auS	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	67 kt
<b>Release Detected:</b>	Onsite Only*	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** Less than  $1.5 \times 10^2$

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**Cloud Direction:** Northerly

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were measured.

**Maximum Iodine Level Detected Offsite:** No iodines were detected in air above background concentrations.

**Maximum Distance Radiation Detected Offsite:** No radiation intensities above background levels were measured.

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**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** Small visible quantities of radioactive steam and/or gas were released. Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

Milk samples taken from Austin, Nevada, on June 30, 1962, showed a concentration of 180 picocuries of  $^{131}\text{I}$  per liter. \*\*

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**References:** (A) (B) (E) (F) (H) (N) (AY) (DA) (EB) (GJ)

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\*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

\*\*This iodine-131 concentration in milk may be attributed to Russian nuclear tests around the time of this test.

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**Test: MARSHMALLOW**

<b>Date:</b>	06/28/62	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,020 ft
<b>Location:</b>	NTS U16a	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Uncontrolled

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**Uncontrolled Release at R+12 Hours, in Curies:**  $3.5 \times 10^4$

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**Release Summary:** An uncontrolled test release due to a stemming failure occurred at H+5 minutes and continued for several days. The estimated release at the time of release was approximately  $1.0 \times 10^6$  curies.

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**References:** (A) (E) (F) (H) (K) (L) (AY) (DA)

**Test: SACRAMENTO**

<b>Date:</b>	06/30/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1430 PDT	<b>Depth of Burial:</b>	500 ft
<b>Location:</b>	NTS U9v	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release:** Slight

NOTE: See statement in explanatory information on "qualitative onsite release data."

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**References:** (A) (C) (E) (F) (H) (AY) (DA)

**Test: SEDAN**

<b>Date:</b>	07/06/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	635 ft
<b>Location:</b>	NTS U10h	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Crater	<b>Yield:</b>	104 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Crater

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**Test Release at R+12 Hours, in Curies:**  $1.5 \times 10^7$

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**Isotopes Identified in the Release:**  $^7\text{Be}$ ,  $^{24}\text{Na}$ ,  $^{56}\text{Mn}$ ,  $^{103}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{140}\text{Ba}$ ,  $^{140}\text{La}$ ,  $^{181}\text{W}$ ,  $^{187}\text{W}$ ,  $^{188}\text{W}$ , and tracers

**Cloud Direction:** Northeasterly

**Maximum Activity Detected in Air Offsite:** 13,000 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 324 mR/h at Diablo, Nevada, and 1,960 mR/h near Queen City Summit, Nevada (unpopulated)

**Maximum Iodine Level Detected Offsite:** 3,700 picocuries of  $^{131}\text{I}$  per cubic meter of air, 13,000 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 60,000 picocuries of  $^{135}\text{I}$  per cubic meter of air at Diablo, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.7 mR/h near McGill, Nevada (north of Ely)

**Release Summary:** A persistent cloud containing appreciable quantities of radioactivity, including particulates, was produced during the cratering process. Fallout was documented to a distance of approximately 200 statute miles downwind.

The significant contributors to the gamma exposure rate at H+24 hours were fission products,  $^{187}\text{W}$ , and  $^{24}\text{Na}$ . Approximately 42% of the gamma exposure rate at H+24 hours was the result of fission products, 55% was from  $^{187}\text{W}$ , 2% was from  $^{24}\text{Na}$ , and less than 1% was from  $^{181}\text{W}$ ,  $^{188}\text{W}$ ,  $^7\text{Be}$ ,  $^{56}\text{Mn}$ , and tracers.

**References:** (A) (C) (E) (F) (G) (H) (AR) (DD)

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<b>Test:</b>	<b>LITTLE FELLER II</b>		
<b>Date:</b>	07/07/62	<b>Sponsor:</b>	DoD
<b>Time:</b>	1200 PDT	<b>Depth of Burial:</b>	3 ft above ground
<b>Location:</b>	NTS Area 18	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Surface	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test/Surface

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**Test Release:** Atmospheric

**References:** (A) (E) (F) (AR)

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<b>Test:</b>	<b>JOHNNIE BOY</b>		
<b>Date:</b>	07/11/62	<b>Sponsor:</b>	DoD
<b>Time:</b>	0945 PDT	<b>Depth of Burial:</b>	23 in
<b>Location:</b>	NTS Area 18	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Crater	<b>Yield:</b>	500 tons
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Crater

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**Test Release:** Atmospheric

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Northerly; subsequently divided into two portions

**Maximum Activity Detected in Air Offsite:** 23,000 picocuries of gross beta activity per cubic meter of air at Twin Springs Ranch, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 3.0 mR/h near the Rattlesnake Maintenance Station, Nevada, by ground monitoring; 3.8 mR/h on a recording radiation monitor at Twin Springs Ranch, Nevada

**Maximum Iodine Level Detected Offsite:** 500 picocuries of  $^{131}\text{I}$  per cubic meter of air, 920 picocuries of  $^{133}\text{I}$ , per cubic meter of air, and 2,300 picocuries of  $^{135}\text{I}$  per cubic meter of air at Twin Springs, Nevada

**Maximum Distance Radiation Detected Offsite:** 3.0 mR/h at 11 miles northeast of Lockes, Nevada

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**Release Summary:** A persistent cloud containing appreciable quantities of radioactivity, including particulates, was produced during the cratering process.

Detonation of this test resulted in the formation of a radioactive cloud that moved north from the test site. This cloud split into two portions. The lower portion traveled slightly west of north to the area of Highway 6 between Tonopah and Warm Springs, Nevada, then traveled east of north after assuming a width of 25-30 miles; the higher portion, above 11,000 ft mean sea level (MSL), traveled east of north.

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**References:** (A) (E) (F) (AR) (GK)

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<b>Test:</b>	<b>MERRIMAC</b>		
<b>Date:</b>	07/13/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	1,366 ft
<b>Location:</b>	NTS U3bd	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Intermediate
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** Less than 1.0

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**Drillback Release Activity at Time of Release, in Curies:**  $2.2 \times 10^4$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $2.2 \times 10^4$

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**Release Summary:** This test released small visible quantities of radioactive steam and/or gases.

A drillback release from the postshot drill hole occurred on July 13, 1962, and lasted for 35 hours.

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**References:** (A) (C) (E) (F) (H) (I) (AR) (DB)

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<b>Test:</b>	<b>SMALL BOY</b>		
<b>Date:</b>	07/14/62	<b>Sponsor:</b>	DoD
<b>Time:</b>	1130 PDT	<b>Depth of Burial:</b>	10 ft above ground
<b>Location:</b>	NTS Area 5	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tower	<b>Yield:</b>	Low
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Surface

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**Test Release:** Atmospheric

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**Isotopes Identified in the Release:**  $^{95}\text{Zr}/^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{132}\text{Te}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Northeasterly

**Maximum Activity Detected in Air Offsite:** 140,000 picocuries of gross beta activity per cubic meter of air at Elko, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 14 mR/h at 13 miles south of Alamo, Nevada

**Maximum Iodine Level Detected Offsite:** 1,100 picocuries of  $^{131}\text{I}$  per cubic meter of air at Caliente, Nevada, and 3,500 picocuries of  $^{131}\text{I}$  per liter in milk at Caliente, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.02 mR/h at seven miles south of Parowan, Utah, on Highway 143

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**Release Summary:** This test resulted in the formation of a radioactive cloud that moved east from surface ground zero and crossed Highway 93 south of Alamo, Nevada. During the night of July 14 and the morning of July 15, the cloud moved further east into Utah, and it reached such low levels that it was detected only in small segments by ground monitoring.

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**References:** (A) (E) (F) (AR) (GL)

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<b>Test:</b>	<b>LITTLE FELLER I</b>		
<b>Date:</b>	07/17/62	<b>Sponsor:</b>	DoD
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	3 ft above ground
<b>Location:</b>	NTS Area 18	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Surface	<b>Yield:</b>	Low
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

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**Test Release:** Atmospheric

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**Isotopes Identified in the Release:**  $^{95}\text{Zr}/^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ , and  $^{131}\text{I}$

**Cloud Direction:** Northerly

**Maximum Activity Detected in Air Offsite:** 4,200 picocuries of gross beta activity per cubic meter of air at Twin Springs, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.7 mR/h at Twin Springs Ranch, Nevada (exposure rate recorder measurement)

**Maximum Iodine Level Detected Offsite:** 1.3 picocuries of  $^{131}\text{I}$  per cubic meter of air at Lockes, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.1 mR/h at Lockes, Nevada (exposure rate recorder measurement)

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**References:** (A) (E) (F) (AR) (GM)

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<b>Test:</b>	<b>WICHITA</b>		
<b>Date:</b>	07/27/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1400 PDT	<b>Depth of Burial:</b>	493 ft
<b>Location:</b>	NTS U9y	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only*	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $7.6 \times 10^2$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$

**Cloud Direction:** Southerly

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were detected.

**Maximum Iodine Level Detected Offsite:** Trace amounts of  $^{131}\text{I}$  in the air at Lathrop Wells, Nevada\*\*

**Maximum Distance Radiation Detected Offsite:** No radiation intensities above background levels were detected.

---

**Release Summary:** At H+26 seconds, gas vented from a fissure in the earth approximately 50 ft north of the emplacement hole and continued for five minutes.

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**References:** (A) (C) (E) (F) (H) (N) (AR) (DB) (GN)

\*As of April 19, 1979, this test was considered to be an onsite only release. See statement in explanatory information on "special designation for onsite releases."

\*\*A review of other data collected following this test indicated that the trace of  $^{131}\text{I}$  was not necessarily attributable to this test.

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<b>Test:</b>	<b>YORK</b>		
<b>Date:</b>	08/24/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	743 ft
<b>Location:</b>	NTS U9z	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^5$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.2 \times 10^5$

**Release Summary:** A drillback release occurred from a postshot drill hole on August 25, 1962, and lasted for 30 hours.

**References:** (A) (C) (E) (F) (H) (AR) (DB)

<b>Test:</b>	<b>BOBAC</b>		
<b>Date:</b>	08/24/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	680 ft
<b>Location:</b>	NTS U3bl	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release:** Some

**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

**References:** (A) (B) (E) (F) (H) (AR) (DB)

<b>Test:</b>	<b>RARITAN</b>		
<b>Date:</b>	09/06/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	516 ft
<b>Location:</b>	NTS U9u	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.2 \times 10^3$

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**Release Summary:** A drillback release occurred from the postshot hole casing on September 6, 1962, and lasted for eight hours.

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**References:** (C) (E) (H) (AR)

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<b>Test:</b>	<b>HYRAX</b>		
<b>Date:</b>	09/14/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1010 PDT	<b>Depth of Burial:</b>	709 ft
<b>Location:</b>	NTS U3bh	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release:** Some

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**References:** (A) (B) (E) (F) (H) (AR) (DB)

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<b>Test:</b>	<b>ALLEGHENY</b>		
<b>Date:</b>	09/29/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	692 ft
<b>Location:</b>	NTS U9x	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $7.6 \times 10^2$

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**Drillback Release Activity at Time of Release, in Curies:**  $8.8 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $8.8 \times 10^2$

---

**Release Summary:** This test released small visible quantities of radioactive steam and/or gases. The test release occurred from the surface ground zero area at H+1 second and lasted for 12 minutes.

A drillback release from a postshot drill hole occurred on September 30, 1962, and lasted for 15 hours.

---

**References:** (A) (C) (E) (H) (AR) (DB)

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**Test: MISSISSIPPI**

<b>Date:</b>	10/05/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,620 ft
<b>Location:</b>	NTS U9ad	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	115 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $4.9 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $4.9 \times 10^3$

---

**Release Summary:** A drillback release occurred from a postshot drill hole on October 7, 1962, and lasted for 15 hours.

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**References:** (A) (C) (E) (H) (AR) (DB)

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**Test: ROANOKE**

<b>Date:</b>	10/12/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	577 ft
<b>Location:</b>	NTS U9q	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $1.9 \times 10^2$

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.0 \times 10^3$

---

**Release Summary:** A minor gaseous release lasting 68 minutes occurred at H+7 minutes from the surface ground zero area through the emplacement hole casing and air dielectric signal and diagnostic cables. The greater part of the radiation was confined to the vicinity of surface ground zero. The venting was stopped by preparations for postshot drilling.

A drillback release from Postshot Hole No. 1 occurred at 0145 hours on October 14, 1962, and lasted for one hour.

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**References:** (A) (C) (E) (H) (AR) (DB)

---

**Test: WOLVERINE**

<b>Date:</b>	10/12/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	240 ft
<b>Location:</b>	NTS U3av	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:** Less than  $1.0 \times 10^2$

---

**Release Summary:** A test release at about H+1 minute occurred from surface ground zero and lasted for approximately 88 minutes. All readings had decayed to background levels by H+90 minutes.

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**References:** (B) (E) (H) (AR)

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**Test: BANDICOOT**

<b>Date:</b>	10/19/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1100 PDT	<b>Depth of Burial:</b>	800 ft
<b>Location:</b>	NTS U3bj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	12.5 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $3.0 \times 10^6$

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**Isotopes Identified in the Release:**  $^{95}\text{Zr}/^{95}\text{Nb}$ ,  $^{103}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Northerly for the lower part of the cloud; south southwesterly for the upper portion of the cloud

**Maximum Activity Detected in Air Offsite:** 52,000 picocuries of gross beta activity per cubic meter of air at Death Valley Junction, California

**Maximum Gamma Exposure Rate Detected Offsite:** Greater than 20 mR/h on Highway 95, seven miles west of the Mercury Junction (Nevada)\*

**Maximum Iodine Level Detected Offsite:** 310 picocuries of  $^{131}\text{I}$  per cubic meter of air, and 2,500 picocuries of  $^{135}\text{I}$  per cubic meter of air at Lathrop Wells, Nevada; maximum  $^{131}\text{I}$  level in milk, 160 picocuries per liter on October 23, 1962, at Springdale, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.01 mR/h at 14.5 miles south of Shoshone, California

---

**Release Summary:** At H+5 seconds a persistent cloud was produced containing appreciable quantities of radioactivity associated with particulates. This test venting, that lasted for five minutes, was from a ground fault near the surface ground zero area.

The radioactive cloud split into two portions. The lower portion of the cloud traveled in a north-northeasterly direction to Area 9 where it remained stagnant, then moved slowly across Flat Top Mesa and north to the Area 12 Compound. The cloud dispersed in the valleys north of the Nevada Test Site. No exposures to people were detected.

The upper portion of the cloud traveled in a southerly direction and traversed a course over Camp Mercury, Cactus Springs, Indian Springs, Lathrop Wells and Highway 95 (Nevada). Upon crossing Highway 95, the cloud was nine miles wide, diffusing rapidly, and proceeding southwest, passing over the Los Angeles, California area.

**References:** (A) (C) (E) (G) (H) (AR) (DB) (GO)

\*Upper limit of measuring instrument.

<b>Test:</b>	<b>SANTEE</b>		
<b>Date:</b>	10/27/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	1,048 ft
<b>Location:</b>	NTS U10f	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $4.0 \times 10^3$

**Release Summary:** A drillback release occurred from the area of the casing and drill hole on October 27, 1962, and lasted for 15 hours.

**References:** (A) (C) (E) (H) (AR) (DB)

<b>Test:</b>	<b>ST. LAWRENCE</b>		
<b>Date:</b>	11/09/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	546 ft
<b>Location:</b>	NTS U2b	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:** 3.5

**Drillback Release Activity at Time of Release, in Curies:**  $6.0 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $6.0 \times 10^3$

**Release Summary:** A test release from the surface ground zero area occurred at H+21 minutes.

A drillback release from a postshot drill hole occurred on November 9, 1962, and lasted for 12 hours.

---

**References:** (C) (E) (H) (AR)

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<b>Test:</b>	<b>ANACOSTIA</b>		
<b>Date:</b>	11/27/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	747 ft
<b>Location:</b>	NTS U9i	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $1.9 \times 10^2$

---

**Drillback Release Activity at Time of Release, in Curies:**  $6.6 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $6.6 \times 10^3$

---

**Release Summary:** A venting occurred at H+8 seconds from the sampling area and at H+35 seconds between the emplacement pipe and the prompt sampling pipe. The release lasted for 23.7 minutes.

The effluent gas gave a maximum reading of 95 mR/h on the ground one mile downwind from surface ground zero at H+0.5 hour. The most significant radiation was confined to the crater and radiochemistry sampling area.

A drillback release from a postshot drill hole occurred on November 28, 1962, and lasted for seven hours.

---

**References:** (A) (C) (E) (H) (AR) (DB)

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<b>Test:</b>	<b>TAUNTON</b>		
<b>Date:</b>	12/04/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	748 ft
<b>Location:</b>	NTS U9aa	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $4.0 \times 10^3$**

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $4.0 \times 10^3$

---

**Release Summary:** A drillback release occurred from the ventilation line and casing on December 4, 1962, and lasted for eight hours.

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**References:** (C) (E) (H) (AR)

---

**Test: MADISON**

<b>Date:</b>	12/12/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	0925 PST	<b>Depth of Burial:</b>	1,318 ft
<b>Location:</b>	NTS U12g.01	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $2.0 \times 10^4$**

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $2.0 \times 10^4$

---

**Release Summary:** A drillback release occurred from a postshot drill hole on December 13, 1962, and lasted for 30 hours.

---

**References:** (A) (C) (E) (H) (AR) (DB)

---

**Test: NUMBAT**

<b>Date:</b>	12/12/62	<b>Sponsor:</b>	LASL
<b>Time:</b>	1045 PST	<b>Depth of Burial:</b>	761 ft
<b>Location:</b>	NTS U3bu	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release: Some**

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**Release Summary:** Some radiation was detected in the area surrounding surface ground zero from gaseous radioactivity released during postshot drilling.

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**References:** (A) (B) (E) (H) (AR) (DB)

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**Test: MANATEE**

<b>Date:</b>	12/14/62	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	192 ft
<b>Location:</b>	NTS U9af	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.8 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.8 \times 10^3$

---

**Release Summary:** A drillback release occurred from the postshot drill hole on December 14, 1962, and lasted for approximately five hours.

---

**References:** (C) (E) (H) (AR) (DB)

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**Test: CASSELMAN**

<b>Date:</b>	02/08/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	994 ft
<b>Location:</b>	NTS U10g	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $6.3 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $6.3 \times 10^3$

---

**Release Summary:** A drillback release occurred from the ventilation line on February 9, 1963, and lasted for ten hours.

---

**References:** (C) (E) (H) (AR) (DB)

---

**Test: CARMEL**

<b>Date:</b>	02/21/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1147 PST	<b>Depth of Burial:</b>	536 ft
<b>Location:</b>	NTS U2h	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $7.2 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $7.2 \times 10^3$

---

**Release Summary:** A drillback release occurred from a postshot drill hole on February 21, 1963, and lasted for two hours.

---

**References:** (C) (E) (H) (AR) (DB)

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**Test:** **KAWEAH**

<b>Date:</b>	02/21/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1147 PST	<b>Depth of Burial:</b>	745 ft
<b>Location:</b>	NTS U9ab	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^4$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $4.0 \times 10^4$

---

**Release Summary:** A drillback release occurred from the postshot drill hole on February 22, 1963, and lasted for 22 hours.

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**References:** (C) (E) (H) (AR) (DB)

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**Test:** **TOYAH**

<b>Date:</b>	03/15/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0822 PST	<b>Depth of Burial:</b>	429 ft
<b>Location:</b>	NTS U9ac	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.2 \times 10^3$

---

**Release Summary:** A drillback release occurred from a postshot drill hole on March 15, 1963, and lasted for five hours.

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**References:** (C) (E) (H) (AR) (JA)

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**Test: CUMBERLAND**

<b>Date:</b>	04/11/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0803 PST	<b>Depth of Burial:</b>	745 ft
<b>Location:</b>	NTS U2e	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $8.5 \times 10^3$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $8.5 \times 10^3$

---

**Release Summary:** A drillback release occurred from a postshot drill hole on April 12, 1963, and lasted for seven hours.

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**References:** (C) (E) (H) (AR) (JB)

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**Test: KOOTANAI\***

<b>Date:</b>	04/24/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0809 PST	<b>Depth of Burial:</b>	597 ft
<b>Location:</b>	NTS U9w	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** 8.2

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**Isotopes Identified in the Release:**  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

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**Drillback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^2$

xenons and iodines in curies:  $4.0 \times 10^2$

---

**Release Summary:** A test release occurred from the surface ground zero cables at H+13 minutes and lasted for two minutes.

A drillback release from a postshot drill hole occurred on April 25, 1963, and lasted for four hours.

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**References:** (C) (E) (H) (Q) (AR) (JC)

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\*While DOE/NV-209 (Rev. 14) lists both KOOTANAI and PAISANO as releasing effluent, reference data indicate that the release was probably attributed to KOOTANAI.

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**Test: DOUBLE TRACKS**

<b>Date:</b>	05/15/63	<b>Sponsor:</b>	Joint US-UK
<b>Time:</b>	0255 PDT	<b>Depth of Burial:</b>	Not Applicable
<b>Location:</b>	NAFR	<b>Purpose:</b>	Storage-Transportation
<b>Type:</b>	Surface	<b>Yield:</b>	Zero
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Plutonium Dispersal

---

**Test Release at R+12 Hours, in Curies:** Unknown

---

**Maximum Activity Detected in Air Offsite:** Estimated 12.1 disintegrations per minute per cubic meter (alpha) at Scotty's Junction, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** No offsite gamma radiation was detected.

**Maximum Iodine Level Detected Offsite:** Non-nuclear experiment, no iodine was produced.

**Maximum Distance Radiation Detected Offsite:** Alpha activity detected on air samplers at Beatty, Nevada and Scotty's Junction, Nevada

---

**Release Summary:** This test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

DOUBLE TRACKS was a non-nuclear experiment that took place on Stonewall Flats at 0255 hours on May 15, 1963. The purpose of this test was to determine data on debris scattering. To accomplish this purpose, conventional high explosives were used to scatter an alpha-emitting isotope into the atmosphere.

Filters from air samplers taken at populated locations indicated a maximum concentration of 12.1 disintegrations per minute/cubic meter at Scotty's Junction, Nevada. (The air sample with this highest reading was from an air sampler with a burned out motor, and the total air flow had to be estimated.) A filter from a sampler run from 1245 hours May 14 to 1300 hours on May 15 in Beatty, Nevada, showed 11.3 disintegrations per minute per cubic meter. Other filters from populated locations showed concentrations above the 0.04 disintegrations per minute per cubic meter background level.

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**References:** (E) (AZ) (DE) (GP)

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**Test: STONES**

<b>Date:</b>	05/22/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0840 PDT	<b>Depth of Burial:</b>	1,295 ft
<b>Location:</b>	NTS U9ae	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Intermediate
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.8 \times 10^3$ 

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**Isotopes Identified in the Release:**  $^{124}\text{Sb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{140}\text{Ba}/^{140}\text{La}$ 

---

**Release Summary:** A drillback release occurred from a postshot drill hole on May 23, 1963, and lasted ten hours.

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**References:** (C) (E) (H) (AR) (DB) (JD) (JE)

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**Test: CLEAN SLATE I**

<b>Date:</b>	05/25/63	<b>Sponsor:</b>	Joint US-UK
<b>Time:</b>	0417 PDT	<b>Depth of Burial:</b>	Not Applicable
<b>Location:</b>	NAFR	<b>Purpose:</b>	Storage-Transportation
<b>Type:</b>	Surface	<b>Yield:</b>	Zero
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Plutonium Dispersal

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**Test Release at R+12 Hours, in Curies:** Unknown

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**Maximum Activity Detected in Air Offsite:** 0.32 disintegrations per minute per cubic meter (alpha) at Lathrop Wells, Nevada**Maximum Gamma Exposure Rate Detected Offsite:** No offsite gamma radiation was detected.

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**Maximum Iodine Level Detected Offsite:** Non-nuclear experiment, no iodine was produced.

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**Release Summary:** The test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

At 0417 hours on May 25, 1963, CLEAN SLATE I, a conventional high explosive device with a plutonium-239 component, was detonated at Cactus Flats, Nevada. The purpose of this experiment was to determine data on the extent and concentration of alpha-emitting debris scattering from a conventional high-explosive device equipped with one or more alpha-emitting components.

Due to fluctuating wind patterns, air filters from populated areas northeast and southeast of surface ground zero showed small concentrations of alpha-emitting material with a maximum

activity of 0.32 disintegrations per minute per cubic meter of air at Lathrop Wells, Nevada. Filters from populated areas (including Hiko, Lund, Mesquite, Pioche, Tonopah, Warm Springs, Las Vegas, Furnace Creek, and Lathrop Wells) showed small concentrations of contaminated material.

**References:** (E) (AZ) (DE) (GQ)

**Test: PLEASANT**

<b>Date:</b>	05/29/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0803 PDT	<b>Depth of Burial:</b>	690 ft
<b>Location:</b>	NTS U9ah	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:**  $7.6 \times 10^2$

**Isotopes Identified in the Release:**  $^{135}\text{Xe}$  and  $^{138}\text{Cs}$

**Drillback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^4$

**Isotopes Identified In the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Release Summary:** A test release occurred from surface ground zero cables at H+15 minutes and lasted for 2.5 hours.

A drillback release occurred from a postshot drill hole on May 29, 1963, and lasted for 24 hours.

**References:** (C) (E) (H) (AR) (JF) (JG)

**Test: CLEAN SLATE II**

<b>Date:</b>	05/31/63	<b>Sponsor:</b>	Joint US-UK
<b>Time:</b>	0347 PDT	<b>Depth of Burial:</b>	Not Applicable
<b>Location:</b>	NAFR	<b>Purpose:</b>	Storage-Transportation
<b>Type:</b>	Surface	<b>Yield:</b>	Zero
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test/Plutonium Dispersal

**Test Release at R+12 Hours, in Curies:** Unknown

**Release Summary:** This test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

CLEAN SLATE II, the third non-nuclear experiment of Operation Roller Coaster, was carried out on Cactus Flats, Nevada, at 0347 hours, May 31, 1963. The purpose of this detonation was to determine data on the extent and concentration of debris scattering from a conventional high-explosive device equipped with one or more alpha-emitting isotope components.

Air filter results from 31 permanent stations surrounding the test area indicated that any material released from CLEAN SLATE II was confined to the Cactus Flats location.

**References:** (E) (AZ) (DE) (GR)

<b>Test:</b>	<b>YUBA</b>		
<b>Date:</b>	06/05/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	795 ft
<b>Location:</b>	NTS U12b.10	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Tunnel	<b>Yield:</b>	3.1 kt
<b>Release Detected:</b>	Offsite (Drillback Only)	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

**Test Release at R+12 Hours, in Curies:**  $1.1 \times 10^2$

**Isotopes Identified in the Release:**  $^{88}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Cs}$

**Drillback Release Activity at Time of Release, in Curies:**  $7.2 \times 10^4$

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were measured.

**Maximum Iodine Level Detected Offsite:** No iodine was detected.

**Maximum Distance Radiation Detected Offsite:** Two miles offsite at Lathrop Wells, Nevada (detected from the drillback release)

**Release Summary:** A test release occurred from the Rad-chem pipe.

A drillback release from a postshot drill hole occurred on June 7, 1963, and lasted for 100 hours.

**References:** (C) (E) (G) (H) (AR) (DB) (GS)

<b>Test:</b>	<b>APSHAPA</b>		
<b>Date:</b>	06/06/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0958 PDT	<b>Depth of Burial:</b>	295 ft
<b>Location:</b>	NTS U9ai	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** 3.8

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**Drillback Release Activity at Time of Release, in Curies:**  $3.0 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $3.0 \times 10^2$

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**Release Summary:** A test release from the surface ground zero area occurred at H+10 minutes and lasted for 25 minutes.

A drillback release from a postshot drill hole occurred on June 6, 1963, and lasted for four hours.

**References:** (C) (E) (H) (AR) (JH)

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<b>Test:</b>	<b>CLEAN SLATE III</b>		
<b>Date:</b>	06/09/63	<b>Sponsor:</b>	Joint US-UK
<b>Time:</b>	0330 PDT	<b>Depth of Burial:</b>	Not Applicable
<b>Location:</b>	NAFR	<b>Purpose:</b>	Storage-Transportation
<b>Type:</b>	Surface	<b>Yield:</b>	Zero
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Plutonium Dispersal

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**Test Release at R+12 Hours, in Curies:** Unknown

**Maximum Activity Detected in Air Offsite:** Not above background; a maximum of  $1.64 \times 10^{-13}$  microcuries per cubic centimeter was measured on the Test Range Complex.

**Maximum Gamma Exposure Rate Detected Offsite:** No offsite gamma radiation was detected.

**Maximum Iodine Level Detected Offsite:** Non-nuclear experiment, no iodine was produced.

**Maximum Distance Radiation Detected Offsite:**  $47.8 \pm 1.5$  disintegrations per minute per square foot of  $^{239,240}\text{Pu}$  on a film collector at Springdale, Utah

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**Release Summary:** This test was part of Operation Roller Coaster. Four storage and transportation tests on the NAFR were conducted as Operation Roller Coaster during May and June 1963.

At 0330 hours on June 9, 1963, the CLEAN SLATE III test was conducted at Cactus Flats, Nevada. The purpose of this test was to determine data on the extent and concentration of alpha-emitting debris scattering from a conventional high-explosive device with one or more radioactive components. This was the fourth and last test of the Roller Coaster series.

Careful ground monitoring to the southeast and southwest of surface ground zero failed to show any readings above background levels. The area was monitored after heavy morning and afternoon rains on June 9, 1963.

**References:** (E) (AZ) (DE) (GT)

<b>Test:</b>	<b>KENNEBEC</b>		
<b>Date:</b>	06/25/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1600 PDT	<b>Depth of Burial:</b>	742 ft
<b>Location:</b>	NTS U2af	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test/Prompt Particle Sampling and Drillback

**Test Release at R+12 Hours, in Curies:** Less than 1.0

**Drillback Release Activity at Time of Release, in Curies:**  $3.0 \times 10^1$

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$

**Release Summary:** A test release from the Rad-chem line occurred at H+10 seconds and lasted for one minute.

A drillback release from the postshot drill hole occurred on June 26, 1963, at 1415 hours and lasted for 1.7 hours.

**References:** (C) (E) (H) (AR) (DB) (JI)

<b>Test:</b>	<b>PEKAN</b>		
<b>Date:</b>	08/12/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	1645 PDT	<b>Depth of Burial:</b>	991 ft
<b>Location:</b>	NTS U3bw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:  $1.1 \times 10^6$**

$^{133}\text{Xe}$ in curies:	$1.6 \times 10^4$
$^{135}\text{Xe}$ in curies:	$1.1 \times 10^6$
$^{131}\text{I}$ in curies:	$1.0 \times 10^1$
$^{133}\text{I}$ in curies:	$2.9 \times 10^2$
$^{135}\text{I}$ in curies:	$6.5 \times 10^2$
$^{85}\text{Kr}$ in curies:	$2.0 \times 10^{-1}$

**References:** (B) (E) (H) (AS) (JK)

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**Detonation:** **KOHOCTON** (simultaneous with NATCHES, separate holes)

<b>Date:</b>	08/23/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0620 PDT	<b>Depth of Burial:</b>	835 ft
<b>Location:</b>	NTS U9ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $3.0 \times 10^3$**

$^{133}\text{Xe}$ , $^{135}\text{Xe}$ , $^{131}\text{I}$ , $^{133}\text{I}$ , and $^{135}\text{I}$ in curies:	$3.0 \times 10^3$
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**Release Summary:** A drillback release occurred from a postshot drill hole and ground zero cables on August 23, 1963, and lasted for 15 hours.

**References:** (C) (E) (H) (AS) (JL)

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**Test:** **AHTANUM**

<b>Date:</b>	09/13/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0653 PDT	<b>Depth of Burial:</b>	740 ft
<b>Location:</b>	NTS U21	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $3.5 \times 10^1$**

$^{133}\text{Xe}$ and $^{135}\text{Xe}$ in curies:	$3.5 \times 10^1$
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**Release Summary:** A drillback release occurred from the postshot drill hole on September 21, 1963, and lasted for four hours.

References: (C) (E) (H) (AS)

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<b>Test:</b>	<b>BILBY</b>		
<b>Date:</b>	09/13/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	2,343 ft
<b>Location:</b>	NTS U3cn	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	249 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies: 1.0**

$^{133}\text{Xe}$  in curies: 1.0

$^{131}\text{I}$ : trace

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References: (B) (E) (H) (J) (AS)

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<b>Test:</b>	<b>CARP</b>		
<b>Date:</b>	09/27/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	0720 PDT	<b>Depth of Burial:</b>	1,081 ft
<b>Location:</b>	NTS U3cb	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release Activity at R+12 hours, in Curies:  $5.7 \times 10^2$**

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

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**Drillback Release Activity at Time of Release, in Curies:  $5.5 \times 10^2$**

$^{133}\text{Xe}$  in curies:  $5.5 \times 10^2$

$^{135}\text{Xe}$  in curies:  $5.5 \times 10^{-1}$

$^{131}\text{I}$  in curies:  $6.8 \times 10^{-2}$

$^{133}\text{I}$  in curies: 1.1

$^{88}\text{Rb}$ : trace

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References: (B) (E) (H) (AS)

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**Test: NARRAGUAGUS**

<b>Date:</b>	09/27/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1030 PDT	<b>Depth of Burial:</b>	493 ft
<b>Location:</b>	NTS U2f	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^2$

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**Release Summary:** Radioactivity was released during drillback operations, beginning at 0830 hours on September 29, 1963, and lasting for 13 hours.

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**References:** (C) (E) (H) (AS) (UQ)

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**Test: GRUNION**

<b>Date:</b>	10/11/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	856 ft
<b>Location:</b>	NTS U3bz	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:** approximately  $4.0 \times 10^3$

$^{133}\text{Xe}$  in curies:  $4.0 \times 10^3$  (approximate)

$^{131}\text{I}$  in curies:  $4.3 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $9.9 \times 10^{-2}$

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**References:** (B) (E) (H) (J) (AS)

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**Test: TORNILLO**

<b>Date:</b>	10/11/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1400 PDT	<b>Depth of Burial:</b>	489 ft
<b>Location:</b>	NTS U9aq	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $5.2 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $5.2 \times 10^2$

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**Release Summary:** A drillback release occurred from the postshot drill hole on October 12, 1963, and lasted for 12 hours.

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**References:** (C) (E) (H) (AS) (JM)

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**Test:** **CLEARWATER**

<b>Date:</b>	10/16/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,798 ft
<b>Location:</b>	NTS U12q	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Intermediate
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $4.6 \times 10^3$

$^{133}\text{Xe}$  in curies:  $4.6 \times 10^3$

$^{131}\text{I}$  in curies:  $2.3 \times 10^{-2}$

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**Release Summary:** A drillback release occurred from the postshot drill hole on October 23, 1963, beginning at 1600 hours and lasting for seven hours.

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**References:** (C) (E) (H) (AS) (TY)

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**Test:** **SHOAL**

<b>Date:</b>	10/26/63	<b>Sponsor:</b>	LASL/ARPA
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,204 ft
<b>Location:</b>	Fallon, Nevada*	<b>Purpose:</b>	Vela Uniform
<b>Type:</b>	Shaft	<b>Yield:</b>	12 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $1.1 \times 10^2$

$^{131\text{m}}\text{Xe}$  and  $^{133}\text{Xe}$  in curies:  $1.1 \times 10^2$

$^{131}\text{I}$  in curies: less than 1.0

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**References:** (E) (H) (L) (DU) (JN)

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\*28 miles southeast of Fallon, Nevada

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**Test: ANCHOVY**

<b>Date:</b>	11/14/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	853 ft
<b>Location:</b>	NTS U3bq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours:** Slight**Isotopes Identified in the Release:**  $^{78}\text{As}$  and  $^{138}\text{Xe}$ **Drillback Release Activity at Time of Release, in Curies:**  $1.3 \times 10^5 - 2.3 \times 10^5$ 

$^{133}\text{Xe}$ in curies:	$2.1 \times 10^4$
$^{135}\text{Xe}$ in curies:	$1.1 \times 10^5$
$^{131}\text{I}$ in curies:	2.5
$^{133}\text{I}$ in curies:	$1.1 \times 10^1$
$^{135}\text{I}$ in curies:	$3.5 \times 10^2$
$^{88}\text{Kr}$ in curies:	$1.0 \times 10^4 - 1.0 \times 10^5$

**Release Summary:** There was a small test release, but only qualitative data were available.

Drillback releases occurred on November 15 and December 3, 1963.

**References:** (B) (E) (H) (AS) (JO)**Test: MUSTANG**

<b>Date:</b>	11/15/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	544 ft
<b>Location:</b>	NTS U9at	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^{2*}$ 

$^{133}\text{Xe}$ , $^{133\text{m}}\text{Xe}$ , and $^{135}\text{Xe}$ in curies:	$1.0 \times 10^2$
$^{131}\text{I}$ , $^{133}\text{I}$ , and $^{135}\text{I}$ :	trace

**Release Summary:** Drillback releases occurred on November 16, 1963, beginning at 1200 hours, from the surface ground zero casing, lasting for 35 hours, and from the ventilation system lasting for 26 hours.

**References:** (C) (E) (H) (X) (AS) (JP)

\*An analysis of RAMS data indicated that approximately  $2.8 \times 10^3$  curies of  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$  could have been released through the ventilation system during the postshot drilling period without being detected.

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<b>Test:</b>	<b>GREYS</b>		
<b>Date:</b>	11/22/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0930 PST	<b>Depth of Burial:</b>	987 ft
<b>Location:</b>	NTS U9ax	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Intermediate
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:** Less than  $4.6 \times 10^2$   
 $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ , and  $^{135}\text{Xe}$  in curies: less than  $4.6 \times 10^2$

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**Release Summary:** Drillback releases occurred from the drilling rig at 2130 hours on November 23, 1963, lasting for 19 hours, and from the ventilation system on the same day, lasting for 18 hours.

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**References:** (C) (E) (H) (AS) (UT)

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<b>Detonation:</b>	<b>BARRACUDA*</b> (simultaneous with SARDINE, separate holes)		
<b>Date:</b>	12/04/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	0838 PST	<b>Depth of Burial:</b>	864 ft
<b>Location:</b>	NTS U3cr	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $9.5 \times 10^{-3}$

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**Isotopes Identified in the Release:** xenons and iodines

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**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^2$   
 $^{133}\text{Xe}$  in curies:  $1.0 \times 10^2$   
iodines in curies: less than  $4.0 \times 10^{-2}$

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**Release Summary:** A test release occurred at H+12 minutes from surface ground zero and lasted for 72 hours.

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References: (B) (E) (H) (AS)

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**Detonation:** **SARDINE\*** (simultaneous with BARRACUDA, separate holes)

<b>Date:</b>	12/04/63	<b>Sponsor:</b>	LASL
<b>Time:</b>	0838 PST	<b>Depth of Burial:</b>	860 ft
<b>Location:</b>	NTS U3ch	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Low
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $3.0 \times 10^1$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{133}\text{Xe}$

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**Drillback Release Activity at Time of Release, in Curies:** Less than or equal to  $9.0 \times 10^{-2}$   
iodines in curies: less than or equal to  $9.0 \times 10^{-2}$

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**Release Summary:** A test release from the surface ground zero area occurred at H+12 minutes and lasted for 100 minutes.

References: (B) (E) (H) (AS)

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\*BARRACUDA and SARDINE are one test because these detonations occurred within the time frame and proximity as defined in the Threshold Test Ban Treaty. They are listed separately because of individual test data.

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**Test:** **EAGLE**

<b>Date:</b>	12/12/63	<b>Sponsor:</b>	LRL
<b>Time:</b>	0802 PST	<b>Depth of Burial:</b>	540 ft
<b>Location:</b>	NTS U9av	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	5.3 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $7.6 \times 10^2$

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**Isotopes Identified in the Release:**  $^{89}\text{Sr}$ ,  $^{91}\text{Sr}$ ,  $^{92}\text{Sr}$ ,  $^{99}\text{Mo}$ ,  $^{103}\text{Ru}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Cs}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

**Cloud Direction:** Southwesterly over Death Valley and Central Southern California, about 140 miles beyond the point of release

**Maximum Activity Detected in Air Offsite:** 24 picocuries of gross beta activity per cubic meter of air at Death Valley Junction, California

**Maximum Gamma Exposure Rate Detected Offsite:** No readings above background levels were recorded.

**Maximum Iodine Level Detected Offsite:** 10 picocuries of  $^{135}\text{I}$  per cubic meter of air, and 35 picocuries of  $^{133}\text{I}$  per cubic meter of air at Death Valley Junction, California.

**Maximum Distance Radiation Detected Offsite:** Isotopic activity was detected in air samples only as far as Death Valley Junction, California.

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $2.0 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies: less than  $2.0 \times 10^2$

$^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$  in curies: less than  $1.0 \times 10^{-1}$

---

**Release Summary:** Venting occurred from the line-of-site (LOS) pipe at H+30 seconds and lasted for three minutes.

A drillback release occurred from the ventilation system at 1300 hours on December 15, 1963, and lasted for 83 hours.

---

**References:** (C) (D) (E) (G) (H) (Z) (AS) (GU) (JQ)

---

**Test:** **TUNA**

**Date:** 12/20/63

**Sponsor:** LASL

**Time:** 0724 PST

**Depth of Burial:** 1,359 ft

**Location:** NTS U3de

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** Low

**Release Detected:** Onsite Only

**Type of Release:** Test

---

**Test Release Activity at R+12 Hours, in Curies:** Less than  $1.2 \times 10^{-1}$

---

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**References:** (B) (E) (H) (AS)

---

**Test:** **FORE**

**Date:** 01/16/64

**Sponsor:** LRL

**Time:** 0800 PST

**Depth of Burial:** 1,609 ft

**Location:** NTS U9ao

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** 20 to 200 kt

**Release Detected:** Onsite Only

**Type of Release:** Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^3$

$^{133}\text{Xe}$  in curies:  $8.9 \times 10^2$

$^{135}\text{Xe}$  in curies:  $2.9 \times 10^2$

---

**Release Summary:** A drillback release occurred from the ventilation system at 1455 hours on January 18, 1964, and lasted for 28.5 hours.

---

**References:** (C) (E) (H) (AS) (JR)

---

**Test:** **OCONTO**

**Date:** 01/23/64                      **Sponsor:** LRL

**Time:** 0800 PST                      **Depth of Burial:** 868 ft

**Location:** NTS U9ay                      **Purpose:** Weapons Related

**Type:** Shaft                              **Yield:** 10.5 kt

**Release Detected:** Offsite                      **Type of Release:** Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.0 \times 10^4$

$^{133}\text{Xe}$  in curies:  $9.9 \times 10^3$

$^{135}\text{Xe}$  in curies:  $2.1 \times 10^4$

$^{131}\text{I}$  in curies:  $1.0 \times 10^{-3}$

$^{133}\text{I}$  in curies:  $5.0 \times 10^{-4}$

---

**Cloud Direction:** Northerly

**Maximum Activity Detected in Air Offsite:** No gross beta activities were above normal levels.

**Maximum Gamma Exposure Rate Detected Offsite:** No readings were above background levels. (Detected by aerial monitoring only).

**Maximum Iodine Level Detected Offsite:** No iodine was detected.

**Maximum Distance Radiation Detected Offsite:** Radioactivity from redrilling was detected by aerial monitoring to Hancock Summit, Nevada.

---

**Release Summary:** A drillback release occurred from the ventilation system at 2200 hours on January 24, 1964, and lasted for 26 hours. Radioactivity was detected offsite by aerial monitoring only.

---

**References:** (C) (E) (H) (AS) (GV) (JS)

---

<b>Test:</b>	<b>CLUB</b>		
<b>Date:</b>	01/30/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	590 ft
<b>Location:</b>	NTS U2aa	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity at R+12 Hours, in Curies:** 1.2

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.9 \times 10^2$

$^{133}\text{Xe}$  in curies:  $4.8 \times 10^2$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^2$

$^{131}\text{I}$ : trace

$^{133}\text{I}$ : trace

---

**Release Summary:** An test release occurred from the cables at 1025 hours and lasted for two hours.

A drillback release occurred from the ventilation system at 0700 hours on February 1, 1964, and lasted for 10 hours.

---

**References:** (C) (E) (H) (AS) (U7)

---

<b>Test:</b>	<b>SOLENDON</b>		
<b>Date:</b>	02/12/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	0738 PST	<b>Depth of Burial:</b>	493 ft
<b>Location:</b>	NTS U3cz	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:** 9.6

---

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Xe}$

---

**Release Summary:** A test release occurred at H+10 minutes from the surface ground zero area and lasted for 7.5 hours.

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**References:** (B) (E) (H) (AS) (UN)

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**Test: BUNKER**

<b>Date:</b>	02/13/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	745 ft
<b>Location:</b>	NTS U9bb	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity At R+12, in Curies: 1.4**

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**Drillback Release Activity at Time of Release, in Curies: Less than  $4.2 \times 10^2$**  $^{133}\text{Xe}$  in curies: less than  $2.2 \times 10^2$  $^{135}\text{Xe}$  in curies: less than  $2.0 \times 10^2$ 

---

**Release Summary:** A test release occurred from the surface ground zero area at H+4 minutes and lasted for 20 minutes.

A drillback release occurred from the ventilation system beginning at 1200 hours on February 15, 1964, and lasted for five hours.

---

**References:** (C) (E) (H) (AS) (U4)

---

**Test: BONEFISH**

<b>Date:</b>	02/18/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	0737 PST	<b>Depth of Burial:</b>	984 ft
<b>Location:</b>	NTS U3bt	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.9 \times 10^1$** xenons, in curies:  $1.5 \times 10^1$  $^{131}\text{I}$  in curies:  $2.0 \times 10^{-4}$  $^{133}\text{I}$  in curies: 4.0

---

**References:** (B) (E) (H) (AS)

---

**Test: KLUICKITAT**

<b>Date:</b>	02/20/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	1,616 ft
<b>Location:</b>	NTS U10e	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:** Less than  $1.0 \times 10^1$

$^{133}\text{Xe}$ in curies:	less than 7.9
$^{135}\text{Xe}$ in curies:	less than 1.9
$^{131}\text{I}$ in curies:	less than $2.0 \times 10^{-1}$
$^{133}\text{I}$ in curies:	less than $2.0 \times 10^{-1}$
$^{135}\text{I}$ in curies:	less than $2.0 \times 10^{-2}$

**Release Summary:** A drillback release occurred from the ventilation system.

**References:** (C) (E) (H) (AS) (JT)

**Test: HANDICAP**

<b>Date:</b>	03/12/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	470 ft
<b>Location:</b>	NTS U9ba	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release Activity At R+12, in Curies:**  $3.0 \times 10^2$

**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^{-1}$

$^{133}\text{Xe}$ in curies:	$2.0 \times 10^{-2}$
$^{135}\text{Xe}$ in curies:	$8.0 \times 10^{-2}$

**Release Summary:** Test releases occurred from the cable cutting at H+110 minutes, lasting for 30 minutes, and from the surface ground zero area at H+6 hours, lasting for 27 hours.

A drillback release occurred through the ventilation system.

**References:** (C) (H) (AS) (UR)

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<b>Test:</b>	<b>PIKE</b>		
<b>Date:</b>	03/13/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	0802 PST	<b>Depth of Burial:</b>	374 ft
<b>Location:</b>	NTS U3cy	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $1.2 \times 10^5$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

**Cloud Direction:** Southeasterly over Cactus Springs and Las Vegas, Nevada, and over California and Arizona the next day

**Maximum Activity Detected in Air Offsite:** 76,000 picocuries of gross beta activity per cubic meter of air five miles west of Cactus Springs, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 5.9 mR/h at Cactus Springs, Nevada

**Maximum Iodine Level Detected Offsite:** 1,000 picocuries of  $^{131}\text{I}$  per cubic meter of air, 36,000 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 510 picocuries of  $^{135}\text{I}$  per cubic meter of air at Cactus Springs, Nevada; maximum concentration of  $^{131}\text{I}$  in commercial milk, 80 picocuries per liter at Yuma, Arizona, and Winterhaven, California

**Maximum Distance Radiation Detected Offsite:** 0.03 mR/h at 17.8 miles southeast of the junction of Boulder Highway and Sahara Avenue, Las Vegas, Nevada

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**Release Summary:** An test release from ground fractures occurred at H+10 seconds and lasted for approximately one minute. Fresh fission products were detected as far as 341 miles from surface ground zero.

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**References:** (B) (D) (E) (G) (H) (P) (Z) (AS) (DF) (DG) (FA) (JU)

---

<b>Test:</b>	<b>HOOK</b>		
<b>Date:</b>	04/14/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0640 PST	<b>Depth of Burial:</b>	668 ft
<b>Location:</b>	NTS U9bc	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** 2.2

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**Drillback Release Activity at Time of Release, in Curies:** Less than  $3.5 \times 10^2$

$^{133}\text{Xe}$  in curies: less than  $1.3 \times 10^2$

$^{135}\text{Xe}$  in curies: less than  $2.2 \times 10^2$

---

**Release Summary:** A test release occurred from the surface ground zero area at H+5 minutes and lasted for 11 minutes.

Drillback releases occurred from the emplacement casing at 2000 hours on April 14, 1964, lasting for 16.5 hours, and from the ventilation system at 1900 hours April 15, 1964, lasting for 13 hours.

---

**References:** (C) (E) (H) (AS) (US)

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**Test:** **STURGEON**

<b>Date:</b>	04/15/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	492 ft
<b>Location:</b>	NTS U3bo	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.3 \times 10^2$

$^{133}\text{Xe}$  in curies:  $9.0 \times 10^1$

$^{135}\text{Xe}$  in curies:  $1.4 \times 10^2$

$^{131}\text{I}$  in curies:  $1.0 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $6.0 \times 10^{-1}$

$^{135}\text{I}$  in curies: 2.5

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**References:** (B) (E) (H) (AS) (JV)

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**Test:** **BOGEY**

<b>Date:</b>	04/17/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0729 PST	<b>Depth of Burial:</b>	390 ft
<b>Location:</b>	NTS U9au	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity At R+12, in Curies:** 6.9

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $5.9 \times 10^1$

$^{133}\text{Xe}$  in curies: less than  $4.4 \times 10^1$   
 $^{135}\text{Xe}$  in curies: less than 9.5  
 $^{131}\text{I}$  in curies: less than 1.0  
 $^{133}\text{I}$  in curies: less than 1.0  
 $^{135}\text{I}$  in curies: less than 1.0  
others, in curies: less than 2.0

---

**Release Summary:** Test releases occurred from the cable connectors at H+10 minutes, lasting for eight minutes, and from the cable cuttings at 1000 hours on April 17, 1964, lasting for 30 minutes.

Drillback releases occurred from the drilling stem at 0100 hours on April 19, 1964, lasting for six hours, and from the ventilation system (no time or duration given).

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**References:** (C) (E) (H) (AS) (U1)

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<b>Test:</b>	<b>TURF</b>		
<b>Date:</b>	04/24/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	1210 PST	<b>Depth of Burial:</b>	1,663 ft
<b>Location:</b>	NTS U10c	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $2.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.9 \times 10^2$   
 $^{135}\text{Xe}$  in curies: less than 9.8  
 $^{131}\text{I}$  in curies: less than 2.0  
 $^{133}\text{I}$  in curies: less than 2.0  
 $^{135}\text{I}$  in curies: less than 1.0

---

**Release Summary:** Drillback releases occurred from the ventilation system drilling platform at 0505 hours on April 27, 1964, lasting for 28 hours, and from the drill hole at 1545 hours on April 28, 1964, lasting for 5 hours, 45 minutes.

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**References:** (C) (E) (H) (AS) (JW) (JX)

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**Test: PIPEFISH**

<b>Date:</b>	04/29/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	1347 PDT	<b>Depth of Burial:</b>	860 ft
<b>Location:</b>	NTS U3co	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $3.0 \times 10^{-6}$ 

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$ 

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**References:** (B) (E) (H) (AS) (JY)

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**Test: DRIVER**

<b>Date:</b>	05/07/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	492 ft
<b>Location:</b>	NTS U9ar	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity At R+12, in Curies:**  $3.7 \times 10^1$ 

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**Isotopes Identified in the Release:**  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Cs}$ 

---

**Release Summary:** A test release occurred from the surface ground zero casing at H+20 minutes and lasted for 190 minutes.

A drillback release of 0.28 curies of  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$  could have been released and gone undetected because of lower limits of detection.

---

**References:** (C) (E) (H) (AS) (UB)

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**Test: BACKSWING**

<b>Date:</b>	05/14/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0740 PDT	<b>Depth of Burial:</b>	536 ft
<b>Location:</b>	NTS U9aw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $3.7 \times 10^1$

**Isotopes Identified in the Release:**  $^{24}\text{Na}$ ,  $^{56}\text{Mn}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^3$

$^{133}\text{Xe}$ in curies:	3.2
$^{135}\text{Xe}$ in curies:	3.1
$^{138}\text{Xe}$ , $^{135}\text{Xe}$ , and $^{138}\text{Cs}$ in curies:	$1.0 \times 10^3$
iodines:	$1.3 \times 10^1$

---

**Release Summary:** A test release occurred from the surface ground zero casing and LOS pipe at H+4 minutes and lasted for 16 minutes.

Drillback releases occurred from the cable cutting at 0840 hours on May 14, 1964, lasting for 24 hours, and from the ventilation system at 1135 hours on May 16, 1964, lasting for 48 hours.

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**References:** (C) (E) (H) (X) (AS) (JZ)

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**Test: ACE**

<b>Date:</b>	06/11/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0945 PDT	<b>Depth of Burial:</b>	862 ft
<b>Location:</b>	NTS U2n	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** 9.3

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

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**Drillback Release Activity at Time of Release, in Curies:** Less than  $2.0 \times 10^{-1}$

$^{133}\text{Xe}$ and $^{135}\text{Xe}$ in curies:	less than $2.0 \times 10^{-1}$
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**Release Summary:** A test release from the cable cutting area and surface ground zero occurred at H+2.5 hours and lasted for 18 hours.

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**References:** (C) (E) (H) (AS) (KA)

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**Test: DUFFER**

<b>Date:</b>	06/18/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	1,463 ft
<b>Location:</b>	NTS U10dS	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $4.1 \times 10^1$

$^{133}\text{Xe}$  in curies: less than  $3.5 \times 10^1$

$^{135}\text{Xe}$  in curies: less than 5.8

---

**Release Summary:** Three drillback releases occurred from: (1) the emplacement drill hole, beginning at 1033 hours on June 19, 1964, lasting for five minutes; (2) the ventilation system at 0430 hours on June 21, 1964, lasting for 80 minutes; and (3) an explosion at the emplacement hole during the period of July 2 through July 6, 1964.

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**References:** (C) (E) (H) (AS) (UC)

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**Test:** **FADE**

**Date:** 06/25/64

**Sponsor:** LRL

**Time:** 0630 PDT

**Depth of Burial:** 673 ft

**Location:** NTS U9be

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** Less than 20 kt

**Release**

**Type of**

**Detected:** Onsite Only

**Release:** Test and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $3.5 \times 10^1$

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**Isotopes Identified in the Release:**  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{135\text{m}}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:** Less than 1.0

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies: less than 1.0

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**Release Summary:** A test release, from the surface ground zero area in the crater, occurred at H+165 minutes and lasted for 8.75 hours.

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**References:** (C) (E) (H) (AS) (KB)

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**Test:** **DUB**

**Date:** 06/30/64

**Sponsor:** LRL

**Time:** 0633 PDT

**Depth of Burial:** 848 ft

**Location:** NTS U10a

**Purpose:** Plowshare

**Type:** Shaft

**Yield:** Less than 20 kt

**Release**

**Type of**

**Detected:** Onsite Only

**Release:** Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** 5.0

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.4 \times 10^1$

$^{133}\text{Xe}$  in curies:  $2.2 \times 10^1$

$^{135}\text{Xe}$  in curies: 2.3

---

**Release Summary:** A test release from the crater area occurred at approximately H+5 hours and lasted for 83 hours.

A drillback release from the ventilation system occurred at 0530 hours on July 2, 1964, and lasted for 85 hours.

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**References:** (C) (E) (H) (AS) (KC)

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**Test:** **BYE**

<b>Date:</b>	07/16/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0615 PDT	<b>Depth of Burial:</b>	1,277 ft
<b>Location:</b>	NTS U10i	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:** Less than  $3.9 \times 10^2$

$^{133}\text{Xe}$  in curies: less than  $3.9 \times 10^2$

$^{135}\text{Xe}$  in curies: less than 1.0

$^{131}\text{I}$  in curies: less than 1.0

$^{133}\text{I}$  in curies: less than 1.0

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**Release Summary:** Drillback releases occurred from the ventilation system at 1730 hours on July 21, 1964, lasting for 49.5 hours, and from the open drill pipe at 0730 hours on July 22, 1964, lasting for 15.5 hours.

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**References:** (C) (E) (H) (AT) (KD)

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**Test:** **CORMORANT**

<b>Date:</b>	07/17/64	<b>Sponsor:</b>	LASL/UK
<b>Time:</b>	1018 PDT	<b>Depth of Burial:</b>	892 ft
<b>Location:</b>	NTS U3df	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** Approximately 1.0

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Xe}$

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**Drillback Release Activity at Time of Release, in Curies:**  $1.1 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.1 \times 10^1$

$^{135}\text{Xe}$  in curies:  $1.4 \times 10^{-2}$

$^{131}\text{I}$  in curies:  $1.4 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $1.7 \times 10^{-2}$

$^{135}\text{I}$  in curies:  $5.8 \times 10^{-5}$

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**Release Summary:** A test release from the surface ground zero area began at H time and lasted for 20 minutes.

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**References:** (B) (E) (H) (AT)

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**Test: LINKS**

<b>Date:</b>	07/23/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	394 ft
<b>Location:</b>	NTS U9bf	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity At R+12, in Curies:** Less than 6.7

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{88\text{m}}\text{Rb}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ ,  $^{139}\text{Xe}$ ,  $^{138}\text{Cs}$ ,  $^{139}\text{Cs}$ , and  $^{139}\text{Ba}$

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**Release Summary:** Test releases occurred from from surface ground zero at H+10 seconds lasting for sixty minutes, and from the cable cutting at 0830 hours on July 23, 1964, lasting for 1.5 hours.

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**References:** (C) (E) (H) (AT) (UU)

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**Test: ALVA**

<b>Date:</b>	08/19/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	545 ft
<b>Location:</b>	NTS U2j	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	4.4 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $6.1 \times 10^3$

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**Isotopes Identified in the Release:**  $^{56}\text{Mn}$ ,  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Cs}$

**Cloud Direction:** Northerly

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were measured.

**Maximum Iodine Level Detected Offsite:** No iodine detected was attributable to this test.

**Maximum Distance Radiation Detected Offsite:** Detected offsite by aircraft only, near St. George, Utah

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**Drillback Release Activity at Time of Release, in Curies:**  $3.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $3.0 \times 10^2$

$^{135}\text{Xe}$  in curies:  $2.5 \times 10^{-1}$

$^{131}\text{I}$  in curies:  $4.1 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $5.5 \times 10^{-2}$

---

**Release Summary:** A test release from the LOS pipe and shaft occurred at H time and lasted for 3.5 days. The release of radioactivity was detected offsite by aircraft only.

A drillback release occurred from the drilling rig at 2200 hours on August 22, 1964, and lasted for 5.4 days.

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**References:** (C) (E) (H) (Z) (AT) (DH) (EC) (GW) (KE) (MA)

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**Test:** **CANVASBACK**

<b>Date:</b>	08/22/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	1517 PDT	<b>Depth of Burial:</b>	1,470 ft
<b>Location:</b>	NTS U3cp	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^3$

$\text{Xe}^{133}$  in curies:  $2.0 \times 10^3$

$\text{Xe}^{135}$  in curies: 1.0

$\text{I}^{131}$  in curies:  $2.0 \times 10^{-1}$

$\text{I}^{133}$  in curies:  $5.0 \times 10^{-1}$

$\text{I}^{135}$  in curies:  $1.0 \times 10^{-3}$

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**References:** (B) (E) (H) (AT) (TV)

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<b>Test:</b>	<b>SPOON</b>		
<b>Date:</b>	09/11/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	590 ft
<b>Location:</b>	NTS U9bd	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.9 \times 10^2$

$^{133}\text{Xe}$ in curies:	$3.8 \times 10^2$
$^{135}\text{Xe}$ in curies:	$1.3 \times 10^1$
$^{131}\text{I}$ and $^{133}\text{I}$ in curies:	$4.0 \times 10^{-1}$

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**Release Summary:** A drillback release occurred from the ventilation system at 2310 hours on September 13, 1964, and lasted for 24.5 hours. A second release occurred from the drilling rig at 2315 hours on September 13, 1964, and lasted for 27.7 hours.

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**References:** (C) (E) (H) (AT) (UO)

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<b>Test:</b>	<b>PAR</b>		
<b>Date:</b>	10/09/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,325 ft
<b>Location:</b>	NTS U2p	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	38 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $6.1 \times 10^2$

$^{133}\text{Xe}$ in curies:	$5.9 \times 10^2$
$^{133\text{m}}\text{Xe}$ in curies:	2.4
$^{135}\text{Xe}$ in curies:	$2.1 \times 10^1$
other isotopes in curies:	less than 2.0

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**Release Summary:** Drillback releases occurred from the drilling rig at 2230 hours on October 11, 1964, lasting for 4.4 days and from the ventilation system at 0100 hours on October 12, 1964, lasting for 5.5 days.

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**References:** (C) (E) (H) (X) (AT) (KF)

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**Detonation:** **BARBEL** (simultaneous with TURNSTONE, separate holes)

<b>Date:</b>	10/16/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	850 ft
<b>Location:</b>	NTS U3bx	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.9 \times 10^2$

$^{133}\text{Xe}$ in curies:	$1.9 \times 10^2$
$^{135}\text{Xe}$ in curies:	$9.8 \times 10^1$
$^{131}\text{I}$ in curies:	$4.1 \times 10^{-1}$
$^{133}\text{I}$ in curies:	$2.9 \times 10^{-1}$
$^{135}\text{I}$ in curies:	$3.1 \times 10^{-1}$

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**References:** (B) (E) (H) (AT)

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**Test:** **FOREST**

<b>Date:</b>	10/31/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0904 PST	<b>Depth of Burial:</b>	1,249 ft
<b>Location:</b>	NTS U7a	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:** 5.2

$^{133}\text{Xe}$ in curies:	5.0
$^{135}\text{Xe}$ in curies:	$2.0 \times 10^{-1}$
$^{131}\text{I}$ and $^{133}\text{I}$ in curies:	$2.0 \times 10^{-3}$

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**Release Summary:** A drillback release occurred from the drilling rig at 0730 hours on November 3, 1964, and lasted for seven hours.

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**References:** (C) (E) (H) (AT) (KG)

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**Test: HANDCAR**

<b>Date:</b>	11/05/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	1,322 ft
<b>Location:</b>	NTS U10b	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	12 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $6.4 \times 10^1$ **Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ , and  $^{135}\text{Xe}$ **Drillback Release Activity at Time of Release, in Curies:** 5.5 $^{133}\text{Xe}$  in curies: 5.5

**Release Summary:** Test releases occurred from surface ground zero cables at H time, lasting for three hours, and at H+16 hours, lasting for eight hours.

A drillback release from the ventilation system occurred at 2030 hours on December 1, 1964, and lasted for eight days.

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**References:** (C) (E) (H) (AT) (J6)

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**Test: CREPE**

<b>Date:</b>	12/05/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	1315 PST	<b>Depth of Burial:</b>	1,326 ft
<b>Location:</b>	NTS U2q	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.5 \times 10^2$  $^{133}\text{Xe}$  in curies:  $2.4 \times 10^2$  $^{133\text{m}}\text{Xe}$  in curies: 6.1 $^{135}\text{Xe}$  in curies:  $4.0 \times 10^{-1}$ 

**Release Summary:** Drillback releases occurred from: (1) the ventilation system at 1830 hours on December 9, 1964, lasting for 2.6 days; (2) the crater at 2145 hours on December 9, 1964, lasting for 1.3 days; and (3) the ventilation system at 1025 hours on December 13, 1964, lasting for one hour.

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**References:** (C) (E) (H) (AT) (KH)

**Detonation:** **DRILL (SOURCE-LOWER)**  
(simultaneous with DRILL [TARGET-UPPER], same hole)

<b>Date:</b>	12/05/64	<b>Sponsor:</b>	LRL
<b>Time:</b>	1315 PST	<b>Depth of Burial:</b>	722 ft
<b>Location:</b>	NTS U2ai	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	3.4 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $6.1 \times 10^4$

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**Isotopes Identified in the Release:**  $^{56}\text{Mn}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ ,  $^{137}\text{Cs}$ ,  $^{138}\text{Cs}$ , and  $^{142}\text{La}$

**Cloud Direction:** Southerly; east of Lathrop Wells, Nevada

**Maximum Activity Detected in Air Offsite:** 0.62 picocuries of gross beta activity per cubic meter of air at Death Valley Junction, California, and 1.6 picocuries of  $^{135}\text{Xe}$  per cubic meter of air at Lathrop Wells, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.20 mR/h on Highway 95, five miles east of Lathrop Wells, Nevada

**Maximum Iodine Level Detected Offsite:** 1.1 picocuries of  $^{131}\text{I}$  per cubic meter of air at Shoshone, California; 300 picocuries of  $^{131}\text{I}$  per kilogram, 300 picocuries of  $^{133}\text{I}$  per kilogram, and 60 picocuries of  $^{132}\text{I}$  per kilogram were measured in vegetation samples five miles east of Lathrop Wells, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.01 mR/h at 17 miles south of Lathrop Wells, Nevada, on Highway 29

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**Drillback Release Activity at Time of Release, in Curies:**  $4.2 \times 10^2$

$^{133}\text{Xe}$  in curies:  $4.1 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 5.3

$^{131}\text{I}$  in curies: less than 1.0

$^{133}\text{I}$  in curies: less than 1.0

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**Release Summary:** Test releases occurred from the crater at H+20 minutes, lasting for 9.5 hours and at H+10 hours, lasting for 5.4 days. An EG&G NATS plane traced the effluent south over the Mojave Desert east of Barstow, California, towards Yuma, Arizona.

A drillback release from the drilling rig occurred at 1500 hours on December 14, 1964, and lasted for 1.6 days.

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**References:** (C) (E) (H) (Z) (AT) (DI) (ED) (KI) (KJ) (UA)

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**Test: PARROT**

<b>Date:</b>	12/16/64	<b>Sponsor:</b>	LASL
<b>Time:</b>	1200 PST	<b>Depth of Burial:</b>	591 ft
<b>Location:</b>	NTS U3dk	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	1.3 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours, in Curies:**  $2.3 \times 10^5$ **Isotopes Identified in the Release:**  $^{85m}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$ **Cloud Direction:** Northerly over Highway 25 (Nevada)**Maximum Activity Detected in Air Offsite:** 74 picocuries of gross beta activity per cubic meter of air at 12 miles northwest of Hancock Summit, Nevada**Maximum Gamma Exposure Rate Detected Offsite:** 0.14 mR/h along Highway 25**Maximum Iodine Level Detected Offsite:** 0.6 picocuries of  $^{131}\text{I}$  per cubic meter at Warm Springs Ranch, Nevada, and 6.6 picocuries of  $^{133}\text{I}$  per cubic meter of air at Indian Springs, Nevada**Maximum Distance Radiation Detected Offsite:** 0.015 mR/h at 22 miles south of Sunnyside, Nevada, on Sunnyside Road**Release Summary:** The PARROT test released radioactive effluent that was characterized by an initial burst followed by a continuous leaking of a relatively small amount of activity. The test release started at H+10 minutes and lasted for approximately eight days. The mechanism of this release was later found to be a crack in the LOS pipe below the surface. The release was approximately 45%  $^{138}\text{Cs}$ , 45%  $^{85m}\text{Kr}$ , and 10%  $^{135}\text{Xe}$  (with traces of iodines).**References:** (B) (D) (E) (G) (H) (Z) (AT) (EE) (EF) (FB) (GX) (GY) (KJ) (L3) (MB)**Test: MUDPACK**

<b>Date:</b>	12/16/64	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1210 PST	<b>Depth of Burial:</b>	498 ft
<b>Location:</b>	NTS U10n	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	2.7 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:** Less than  $5.4 \times 10^1$

$^{133}\text{Xe}$  in curies:  $5.0 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 2.0

$^{135}\text{Xe}$  in curies: less than 1.0

$^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$  in curies: less than 1.0

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**Release Summary:** A drillback release occurred from the crater area at 1030 hours on December 19, 1964, and lasted for 12 hours.

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**References:** (C) (E) (H) (AT) (KK) (KL)

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**Test:** **SULKY**

**Date:** 12/18/64                      **Sponsor:** LRL

**Time:** 1135 PST                      **Depth of Burial:** 90 ft

**Location:** NTS U18d                      **Purpose:** Plowshare

**Type:** Shaft                      **Yield:** 92 tons

**Release Detected:** Offsite                      **Type of Release:** Test

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**Test Release at R+12 Hours, in Curies:**  $1.3 \times 10^5$

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**Isotopes Identified in the Release:**  $^{85\text{m}}\text{Kr}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{89}\text{Sr}$ ,  $^{91}\text{Sr}$ ,  $^{91}\text{Y}$ ,  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ ,  $^{138}\text{Cs}$ ,  $^{139}\text{Ba}$ , and  $^{140}\text{Ba}$

**Cloud Direction:** Northerly, between Clark Station and Nyala, Nevada

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected in air samples.

**Maximum Gamma Exposure Rate Detected Offsite:** 0.06 mR/h at Nyala, Nevada

**Maximum Iodine Level Detected Offsite:** No iodines were detected in air, milk, or water samples.

**Maximum Distance Radiation Detected Offsite:** 0.02 mR/h on Highway 6, 19 miles west of Lockes, Nevada

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**Release Summary:** The planned test release occurred from the surface ground zero area at H+1 second and lasted for 35 days.

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**References:** (C) (E) (G) (H) (AT) (DJ) (GY)

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<b>Test:</b>	<b>WOOL</b>		
<b>Date:</b>	01/14/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	706 ft
<b>Location:</b>	NTS U9bh	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^2$

$^{133}\text{Xe}$ in curies:	1.9
$^{133\text{m}}\text{Xe}$ in curies:	$6.0 \times 10^{-2}$
$^{135}\text{Xe}$ in curies:	$2.0 \times 10^2$
$^{135}\text{I}$ in curies:	less than 1.0
other isotopes in curies:	less than 1.0

**Release Summary:** Drillback releases occurred from the surface ground zero casing at 1730 hours on January 14, 1965, lasting for 2.5 hours, and from the ventilation system at 0150 hours on January 15, 1965, lasting for 3.3 days.

**References:** (C) (E) (H) (AT) (KM)

<b>Test:</b>	<b>TERN</b>		
<b>Date:</b>	01/29/65	<b>Sponsor:</b>	LASL
<b>Time:</b>	1022 PST	<b>Depth of Burial:</b>	689 ft
<b>Location:</b>	NTS U3dw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

**Test Release Activity at R+12 Hours, in Curies:**  $1.7 \times 10^2$

**Isotopes Identified in the Release:**  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Release Summary:** A test release occurred from the surface ground zero area at H+6.7 hours and lasted for approximately 4.6 days.

**References:** (B) (E) (H) (AT)

**Test: CASHMERE**

<b>Date:</b>	02/04/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	762 ft
<b>Location:</b>	NTS U2ad	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies: 7.9**

$^{133}\text{Xe}$  in curies: 7.8

$^{133\text{m}}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$

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**Release Summary:** A drillback release occurred from the ventilation system at 0300 hours on February 14, 1965, and lasted for 4.2 hours.

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**References:** (C) (E) (H) (AT) (TW)

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**Test: ALPACA**

<b>Date:</b>	02/12/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0710 PST	<b>Depth of Burial:</b>	737 ft
<b>Location:</b>	NTS U2a	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	330 tons
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:  $4.0 \times 10^4$**

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**Isotopes Identified in the Release:**  $^{89}\text{Kr}$ ,  $^{89}\text{Sr}$ ,  $^{89}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{137}\text{Xe}$ ,  $^{138}\text{Xe}$ ,  $^{137}\text{Cs}$ , and  $^{138}\text{Cs}$

**Cloud Direction:** Southerly direction to Highway 95 (Nevada)

**Maximum Activity Detected in Air Offsite:** 19 picocuries of gross beta activity per cubic meter of air at Barstow, California

**Maximum Gamma Exposure Rate Detected Offsite:** 0.01 mR/h at the junction of Highway 95 and the Mercury turnoff

**Maximum Iodine Level Detected Offsite:** No iodines were detected in air, milk, or vegetation samples.

**Maximum Distance Radiation Detected Offsite:** Readings were at background levels; 0.004 mR/h at Johnnie's Mine, Nevada

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**Release Summary:** Test releases occurred from the surface ground zero area at H hour, lasting for 30 minutes, at H+30 minutes, lasting for three hours, and at H+3.5 hours, lasting for five hours.

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**References:** (C) (D) (E) (H) (Z) (AT) (GZ) (KN) (MC)

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<b>Test:</b>	<b>MERLIN</b>		
<b>Date:</b>	02/16/65	<b>Sponsor:</b>	LASL
<b>Time:</b>	0930 PST	<b>Depth of Burial:</b>	971 ft
<b>Location:</b>	NTS U3ct	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	10.1 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours:** Trace

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**Release Summary:** A test release from the surface ground zero area started at H+13.5 hours and lasted for 5 days.

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**References:** (B) (E) (H) (AT)

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<b>Test:</b>	<b>WISHBONE</b>		
<b>Date:</b>	02/18/65	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	0818 PST	<b>Depth of Burial:</b>	588 ft
<b>Location:</b>	NTS U5a	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $6.9 \times 10^3$

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**Isotopes Identified in the Release:**  $^{85m}\text{Kr}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{133m}\text{Xe}$ , and  $^{135}\text{Xe}$

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**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^4$

$^{133}\text{Xe}$  in curies:  $1.2 \times 10^4$

$^{133m}\text{Xe}$  in curies: 4.7

$^{135}\text{Xe}$  in curies:  $4.1 \times 10^3$

$^{131}\text{I}$  in curies: 1.3

$^{133}\text{I}$  in curies:  $1.5 \times 10^1$

$^{135}\text{I}$  in curies:  $2.6 \times 10^1$

---

**Release Summary:** Test releases occurred from surface ground zero as follows: (1) at H+4 minutes, lasting for 20 minutes; (2) at H+135 minutes, lasting for 6.4 hours; and (3) at H+12.6 hours, lasting for 4.6 hours.

Drillback releases occurred from: (1) the drilling rig at 0415 hours on February 19, 1965, lasting for nine days; (2) the ventilation system at 0905 hours on February 19, 1965, lasting for 46 hours; (3) the ventilation system at 1730 hours on February 25, 1965, lasting for 37 hours.

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**References:** (C) (E) (H) (AT) (KO) (KP) (KQ) (MD)

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<b>Test:</b>	<b>SEERSUCKER</b>		
<b>Date:</b>	02/19/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0728 PST	<b>Depth of Burial:</b>	472 ft
<b>Location:</b>	NTS U9bm	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity at R+12 Hours, in Curies:** 1.3

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ , and  $^{135}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $4.1 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.9 \times 10^1$

$^{135}\text{Xe}$  in curies:  $2.1 \times 10^1$

iodines, in curies: less than 1.0

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**Release Summary:** A test release occurred from the surface ground zero area at H+9 minutes and lasted for 22 minutes.

A drillback release occurred from the drilling rig at 2335 hours on February 20, 1965, and lasted for 31.5 hours.

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**References:** (C) (E) (H) (AT) (UI)

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<b>Test:</b>	<b>WAGTAIL</b>		
<b>Date:</b>	03/03/65	<b>Sponsor:</b>	LASL
<b>Time:</b>	1113 PST	<b>Depth of Burial:</b>	2,461 ft
<b>Location:</b>	NTS U3an	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.3 \times 10^1$**

$^{133}\text{Xe}$  in curies:  $1.3 \times 10^1$

$^{131}\text{I}$  in curies:  $3.0 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $2.0 \times 10^{-2}$

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**Release Summary:** A drillback release occurred on March 10, 1965.

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**References:** (B) (E) (H) (AT) (J4)

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**Test: SUEDE**

**Date:** 03/20/65                      **Sponsor:** LRL

**Time:** 0723 PST                      **Depth of Burial:** 469 ft

**Location:** NTS U9bk                      **Purpose:** Weapons Related

**Type:** Shaft                      **Yield:** Less than 20 kt

**Release Detected:** Onsite Only                      **Type of Release:** Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.3 \times 10^3$**

$^{133}\text{Xe}$  in curies:  $9.6 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies:  $5.7 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $3.2 \times 10^2$

$^{131}\text{I}$  in curies:  $1.0 \times 10^{-1}$

$^{133}\text{I}$  in curies: 1.6

$^{135}\text{I}$  in curies:  $8.9 \times 10^{-1}$

---

**Release Summary:** A release occurred from the drilling rig at 1445 hours on March 21, 1965, lasting for 15.5 hours. Another drillback release occurred from the ventilation system at 2330 hours on March 21, 1965, lasting for 21 hours.

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**References:** (C) (E) (H) (AT) (UP)

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**Test: CUP**

**Date:** 03/26/65                      **Sponsor:** LRL

**Time:** 0734 PST                      **Depth of Burial:** 1,761 ft

**Location:** NTS U9cb                      **Purpose:** Weapons Related

**Type:** Shaft                      **Yield:** 20 to 200 kt

**Release Detected:** Onsite Only                      **Type of Release:** Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $4.7 \times 10^3$**

$^{133}\text{Xe}$  in curies:  $4.3 \times 10^3$

$^{133\text{m}}\text{Xe}$  in curies:  $1.4 \times 10^2$

$^{135}\text{Xe}$  in curies:  $2.3 \times 10^2$

$^{131}\text{I}$  in curies:  $3.0 \times 10^{-1}$

$^{133}\text{I}$  in curies:  $7.0 \times 10^{-1}$

---

**Release Summary:** Drillback releases occurred from: (1) the ventilation system at 1450 hours on March 29, 1965, lasting for 89 hours; (2) the drilling rig at 1520 hours on April 3, 1965, lasting for eight hours; and (3) the ventilation system at 2120 hours on April 4, 1965, lasting for 6.3 hours.

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**References:** (C) (E) (H) (AT) (KR)

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**Test:** **KESTREL**

**Date:** 04/05/65                      **Sponsor:** LASL

**Time:** 1300 PST                      **Depth of Burial:** 1,467 ft

**Location:** NTS U3dd                      **Purpose:** Weapons Related

**Type:** Shaft                      **Yield:** Less than 20 kt

**Release Detected:** Onsite Only                      **Type of Release:** Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $2.3 \times 10^2$**

$^{133}\text{Xe}$  in curies:  $2.3 \times 10^2$

$^{135}\text{Xe}$  in curies:  $1.9 \times 10^{-1}$

$^{131}\text{I}$  in curies:  $2.9 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $9.0 \times 10^{-2}$

$^{135}\text{I}$  in curies:  $2.9 \times 10^{-4}$

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**Release Summary:** A release occurred on April 10, 1965, beginning at 0535 hours and lasting for 16.5 hours.

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**References:** (B) (E) (H) (AT) (J7)

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**Test: PALANQUIN**

<b>Date:</b>	04/14/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0514 PST	<b>Depth of Burial:</b>	280 ft
<b>Location:</b>	NTS U20k	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Crater	<b>Yield:</b>	4.3 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Crater

**Test Release at R+12 Hours, in Curies:**  $1.1 \times 10^7$ **Isotopes Identified in the Release:**  $^{91}\text{Sr}$ ,  $^{91\text{m}}\text{Y}$ ,  $^{95}\text{Zr}/^{95}\text{Nb}$ ,  $^{97}\text{Zr}/^{97}\text{Nb}$ ,  $^{99}\text{Mo}$ ,  $^{99}\text{Tc}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ , and  $^{140}\text{Ba}/^{140}\text{La}$ **Cloud Direction:** Northerly to Pine Creek Ranch, Nevada**Maximum Activity Detected in Air Offsite:** 23,000 picocuries of gross beta activity per cubic meter of air at Clark Station, Nevada (populated site); highest concentration in an unpopulated site, 87,000 picocuries of gross beta activity per cubic meter of air at Highway 6, eight miles east of the Tonopah Test Range Road**Maximum Gamma Exposure Rate Detected Offsite:** 3 mR/h at Stone Cabin Ranch, Nevada**Maximum Iodine Level Detected Offsite:** 32,000 picocuries of  $^{135}\text{I}$  per cubic meter of air, 16,000 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 4,100 picocuries of  $^{131}\text{I}$  per cubic meter of air at Clark Station, Nevada (populated site); highest concentration in an unpopulated site, 12,000 picocuries of  $^{131}\text{I}$  per cubic meter of air, 65,000 picocuries of  $^{133}\text{I}$  per cubic meter of air and 160,000 picocuries of  $^{135}\text{I}$  per cubic meter of air at Highway 6, eight miles east of the Tonopah Test Range Road; highest  $^{131}\text{I}$  concentration in milk, 11,000 picocuries per liter at Martin Ranch near Eureka, Nevada; no children present**Maximum Distance Radiation Detected Offsite:** 0.03 mR/h at Council, Idaho**Release Summary:** The planned test release occurred at the surface ground zero area at H hour and lasted for one minute.**References:** (C) (E) (H) (M) (AT) (DK) (GY) (KS)**Test: GUM DROP**

<b>Date:</b>	04/21/65	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1400 PST	<b>Depth of Burial:</b>	1,000 ft
<b>Location:</b>	NTS U16a.02	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled and Drillback

**Controlled Release Activity at Time of Release, in Curies:**  $1.9 \times 10^3$

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**Isotopes Detected in Release:** Primarily  $^{135}\text{Xe}$

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**Drillback Release Activity at Time of Release, in Curies:**  $2.3 \times 10^{-1}$

$^{133}\text{Xe}$  and  $^{133\text{m}}\text{Xe}$  in curies:  $2.3 \times 10^{-1}$

---

**Release Summary:** A controlled, filtered ventilation of the tunnel complex occurred between H+3.5 hours and H+34 hours. Activity was primarily noble gases (xenon-135).

A drillback release from the ventilation system occurred at 0130 hours on May 2, 1965, and lasted for 66 hours.

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**References:** (C) (E) (H) (L) (AT) (KT) (KU) (L4)

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**Test:** **CHENILLE**

<b>Date:</b>	04/22/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0539 PST	<b>Depth of Burial:</b>	459 ft
<b>Location:</b>	NTS U9bg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release Activity at R+12 Hours, in Curies:**  $9.3 \times 10^{-1}$

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$  and  $^{138}\text{Cs}$

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**Drillback Release Activity at Time of Release, in Curies:** Less than  $1.1 \times 10^2$

$^{133}\text{Xe}$  and  $^{133\text{m}}\text{Xe}$  in curies: less than  $2.0 \times 10^1$

$^{135}\text{Xe}$  in curies: less than  $9.0 \times 10^1$

$^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$  in curies:  $3.8 \times 10^{-3}$

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**Release Summary:** A test release occurred from the emplacement casing at H+50 minutes and lasted for 17 minutes.

A drillback release occurred from the drilling rig at 0630 hours on April 23, 1965, and lasted for nine hours. A second release occurred from the ventilation system at 1020 hours on April 23, 1965, and lasted for 11.6 hours.

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**References:** (C) (E) (H) (X) (AT) (U6)

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<b>Test:</b>	<b>TEE</b>		
<b>Date:</b>	05/07/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0847 PDT	<b>Depth of Burial:</b>	624 ft
<b>Location:</b>	NTS U2ab	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	7 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:**  $1.6 \times 10^3$

**Isotopes Identified in the Release:**  $^{24}\text{Na}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{91}\text{Kr}$ ,  $^{91}\text{Sr}$ ,  $^{122}\text{Sb}$ ,  $^{124}\text{Sb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{139}\text{Xe}$ ,  $^{140}\text{Xe}$ ,  $^{138}\text{Cs}$ ,  $^{139}\text{Ba}$ , and  $^{140}\text{Ba}$

**Cloud Direction:** Southerly to Highway 95 (Nevada)

**Maximum Activity Detected in Air Offsite:** 28 picocuries of gross beta activity per cubic meter of air at four miles east of the junction of Highway 95 and Mercury turnoff.

**Maximum Gamma Exposure Rate Detected Offsite:** 0.05 mR/h at four miles east of the Mercury turnoff on Highway 95

**Maximum Iodine Level Detected Offsite:** None was detected in air samples. Iodine-133 was detected on sage brush near the junction of Highway 95 and Mercury turnoff.

**Maximum Distance Radiation Detected Offsite:** 0.05 mR/h at 14 miles south of the Mercury turnoff on Highway 95

**Drillback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^1$

$^{133}\text{Xe}$  in curies: 9.1

$^{133\text{m}}\text{Xe}$  in curies:  $3.6 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^1$

$^{133}\text{I}$  in curies: low levels

**Release Summary:** Test releases occurred from the LOS pipe at surface ground zero at H+1.2 minutes, lasting for six minutes and from the surface ground zero area at H+8 minutes, lasting for 107 hours.

A drillback release from the ventilation system occurred at 1400 hours on May 9, 1965, and lasted for three hours.

**References:** (C) (D) (E) (H) (P) (Z) (AT) (EG) (FC) (GY) (HA) (KV)

<b>Test:</b>	<b>TWEED</b>		
<b>Date:</b>	05/21/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0608 PDT	<b>Depth of Burial:</b>	922 ft
<b>Location:</b>	NTS U9bn	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $6.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $3.3 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 8.6

$^{135}\text{Xe}$  in curies:  $2.6 \times 10^2$

$^{131}\text{I}$  in curies:  $1.4 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $6.8 \times 10^{-3}$

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**Release Summary:** Drillback releases occurred from the ventilation system at 1300 hours on May 22, 1965, lasting for four days, and from the drilling rig at 0700 hours on May 25, 1965, lasting for five days.

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**References:** (C) (E) (H) (AT) (KW)

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<b>Test:</b>	<b>ORGANDY</b>		
<b>Date:</b>	06/11/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	1328 PDT	<b>Depth of Burial:</b>	551 ft
<b>Location:</b>	NTS U9bo	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $1.3 \times 10^1$

$^{133}\text{Xe}$  in curies: 7.5

$^{133\text{m}}\text{Xe}$  in curies:  $5.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 4.5

iodines, in curies: less than 1.0

---

**Release Summary:** A drillback release occurred from the drilling rig at 2215 hours on June 11, 1965, and lasted for 39 hours. A second release from the ventilation system occurred at 1100 hours on June 12, 1965, and lasted for 38 hours.

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**References:** (C) (E) (H) (AT) (UW)

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<b>Test:</b>	<b>DILUTED WATERS</b>		
<b>Date:</b>	06/16/65	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	0930 PDT	<b>Depth of Burial:</b>	625 ft
<b>Location:</b>	NTS U5b	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $3.0 \times 10^4$

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**Isotopes Identified in the Release:**  $^{99}\text{Mo}$ ,  $^{103}\text{Ru}$ ,  $^{105}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Cs}$ ,  $^{139}\text{Ba}$ ,  $^{140}\text{Ba}/^{140}\text{La}$ ,  $^{141}\text{Ce}$ , and kryptons

**Cloud Direction:** Northeasterly to Highway 25

**Maximum Activity Detected in Air Offsite:** 7.6 picocuries of gross beta activity per cubic meter of air at Nyala, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.02 mR/h just off the Test Range Complex

**Maximum Iodine Level Detected Offsite:** 130 picocuries of  $^{131}\text{I}$  per liter in milk at Duckwater, Nevada; probably not attributable to this test as no short-lived iodines were found\*

**Maximum Distance Radiation Detected Offsite:** 0.02 mR/h just off the Test Range Complex

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**Release Summary:** Venting occurred at zero time until H+20 minutes due to a stemming failure. There was a gross fission product release.

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**References:** (C) (D) (E) (H) (K) (L) (P) (Z) (AT) (EW) (GY) (HB) (HC) (ME)

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\*Two tests occurred prior to the DILUTED WATERS test that were probably responsible for the  $^{131}\text{I}$  found in milk samples collected for DILUTED WATERS. One test was the detonation of a nuclear device on the Chinese mainland on May 14, 1965, and the other was a test of a nuclear rocket engine at the Nuclear Rocket Development Station on May 20, 1965. The iodine isotopes found in milk samples subsequent to the DILUTED WATERS test were probably the result of the three tests, and it is not possible to assess the exact contribution from any one source.

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**Test: TINY TOT**

<b>Date:</b>	06/17/65	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	364 ft
<b>Location:</b>	NTS U15e	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Uncontrolled

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**Uncontrolled Release at R+12 Hours, in Curies: 7.0**

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ ,  $^{138}\text{Cs}$ , and iodines

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**Release Summary:** A test release began from the area of the shaft and cables at H+15 minutes and lasted for 14.8 hours. Seepage occurred through the shaft and at the cables.

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**References:** (B) (E) (H) (L) (AT) (KX) (KY)

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**Test: IZZER**

<b>Date:</b>	07/16/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0604 PDT	<b>Depth of Burial:</b>	535 ft
<b>Location:</b>	NTS U9bp	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $3.5 \times 10^{-3}$  $^{133}\text{Xe}$  in curies:  $3.0 \times 10^{-4}$  $^{133\text{m}}\text{Xe}$  in curies:  $1.5 \times 10^{-4}$  $^{135}\text{Xe}$  in curies:  $3.0 \times 10^{-3}$ 

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**Release Summary:** A drillback release occurred from the ventilation line at 0200 hours on July 17, 1965, and lasted for one hour.

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**References:** (C) (E) (H) (AU) (UY)

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<b>Test:</b>	<b>PONGEE</b>		
<b>Date:</b>	07/22/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0621 PDT	<b>Depth of Burial:</b>	440 ft
<b>Location:</b>	NTS U2ah	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release Activity at R+12 Hours, in Curies:** 6.4

**Isotopes Identified in the Release:**  $^{91}\text{Sr}$ ,  $^{91}\text{Kr}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ ,  $^{139}\text{Xe}$ ,  $^{140}\text{Xe}$ ,  $^{138}\text{Cs}$ ,  $^{139}\text{Ba}$ , and  $^{140}\text{Ba}$

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**Drillback Release Activity at Time of Release, in Curies:** 4.2

$^{133}\text{Xe}$  in curies: 1.4

$^{133\text{m}}\text{Xe}$  in curies:  $4.0 \times 10^{-2}$

$^{135}\text{Xe}$  in curies: 2.8

---

**Release Summary:** A test release occurred from the ground zero area at H+1.4 minutes and lasted for 11.5 minutes.

A drillback release occurred from the ventilation system at 0300 hours on July 24, 1965, and lasted for one hour.

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**References:** (C) (E) (H) (AU) (UX) (V2)

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<b>Test:</b>	<b>BRONZE</b>		
<b>Date:</b>	07/23/65	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,742 ft
<b>Location:</b>	NTS U7f	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.7 \times 10^3$

$^{133}\text{Xe}$  in curies:  $1.7 \times 10^3$

$^{135}\text{Xe}$  in curies: 2.2

$^{131}\text{I}$  in curies:  $2.3 \times 10^{-1}$

$^{133}\text{I}$  in curies:  $2.3 \times 10^{-1}$

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**Release Summary:** A release from the drilling pipe occurred at 1610 hours on July 29, 1965.

References: (B) (E) (H) (AU) (TU)

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<b>Test:</b>	<b>TICKING</b>		
<b>Date:</b>	08/21/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0643 PDT	<b>Depth of Burial:</b>	682 ft
<b>Location:</b>	NTS U9bj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.6 \times 10^3$

$^{133}\text{Xe}$  in curies:  $1.4 \times 10^3$

$^{133\text{m}}\text{Xe}$  in curies:  $6.3 \times 10^1$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^3$

$^{131}\text{I}$  in curies:  $1.6 \times 10^{-1}$

$^{132}\text{I}$  in curies: 1.7

$^{133}\text{I}$  in curies:  $1.3 \times 10^{-1}$

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**Release Summary:** A drillback release occurred from the ventilation line at 1400 hours on August 23, 1965, lasting for two hours. A second release occurred from the drilling rig at 0630 hours on August 23, 1965, lasting for 16.25 hours.

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References: (C) (E) (H) (AU) (V0)

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<b>Test:</b>	<b>CENTAUR</b>		
<b>Date:</b>	08/27/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0651 PDT	<b>Depth of Burial:</b>	564 ft
<b>Location:</b>	NTS U2ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $1.1 \times 10^{-1}$

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$  and  $^{138}\text{Cs}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.7 \times 10^1$

$^{133}\text{Xe}$  in curies:  $2.0 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $9.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $3.6 \times 10^1$

$^{131}\text{I}$  in curies:  $2.2 \times 10^{-3}$

$^{132}\text{I}$  in curies:  $2.5 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $6.5 \times 10^{-3}$

---

**Release Summary:** A test release from the surface ground zero area occurred at H+5 minutes and lasted for ten minutes.

A drillback release occurred from the drilling rig at 0420 hours on August 29, 1965, and lasted for 1.5 hours.

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**References:** (C) (E) (H) (AU) (KZ)

---

**Detonation:** **SCREAMER** (simultaneous with MOA, separate holes)

**Date:** 09/01/65 **Sponsor:** LASL

**Time:** 1308 PDT **Depth of Burial:** 991 ft

**Location:** NTS U3dg **Purpose:** Weapons Effects

**Type:** Shaft **Yield:** Less than 20 kt

**Release Detected:** Onsite Only **Type of Release:** Test

---

**Test Release at R+12 Hours, in Curies:**  $6.3 \times 10^4$

---

**Isotopes Identified in the Release:**  $^{88}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

---

**Release Summary:** A release occurred at H+30 minutes and lasted for 25 hours.

---

**References:** (B) (E) (H) (AU) (UF)

---

**Test:** **ELKHART**

**Date:** 09/17/65 **Sponsor:** LRL

**Time:** 0808 PDT **Depth of Burial:** 720 ft

**Location:** NTS 9bs **Purpose:** Weapons Related

**Type:** Shaft **Yield:** Less than 20 kt

**Release Detected:** Onsite Only **Type of Release:** Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.6 \times 10^1$

$^{133}\text{Xe}$  in curies:  $4.0 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.3

$^{135}\text{Xe}$  in curies:  $1.5 \times 10^1$

---

**Release Summary:** A drillback release occurred from the ventilation system at 1300 hours on September 18, 1965, and lasted for 4.75 days.

---

References: (C) (E) (H) (AU) (LA)

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<b>Test:</b>	<b>SEPIA</b>		
<b>Date:</b>	11/12/65	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	791 ft
<b>Location:</b>	NTS U3en	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $4.7 \times 10^{-3}$

$^{131}\text{I}$  in curies:  $1.1 \times 10^{-3}$

$^{133}\text{I}$  in curies:  $3.5 \times 10^{-3}$

$^{135}\text{I}$  in curies:  $1.0 \times 10^{-4}$

---

**Release Summary:** A drillback release occurred on November 16, 1965.

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References: (B) (E) (H) (AU)

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<b>Test:</b>	<b>KERMET</b>		
<b>Date:</b>	11/23/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	1017 PST	<b>Depth of Burial:</b>	643 ft
<b>Location:</b>	NTS U2c	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** Less than 5.5

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**Isotopes Identified in the Release:**  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.8 \times 10^1$

$^{133}\text{Xe}$  in curies: 9.0

$^{133\text{m}}\text{Xe}$  in curies:  $2.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 9.0

---

**Release Summary:** A test release (seepage) occurred from the surface ground zero area beginning at 2100 hours on November 23, 1965, and lasting for 15 hours.

Drillback releases occurred from the ventilation line at 1700 hours on November 24, 1965, lasting for six hours, and from the ventilation line on November 29, 1965, lasting for four hours.

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References: (C) (E) (H) (X) (AU) (V1)

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<b>Test:</b>	<b>CORDUROY</b>		
<b>Date:</b>	12/03/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0713 PST	<b>Depth of Burial:</b>	2,236 ft
<b>Location:</b>	NTS U10k	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^3$

$^{133}\text{Xe}$  in curies:  $1.2 \times 10^3$

$^{133\text{m}}\text{Xe}$  in curies:  $1.7 \times 10^1$

$^{135}\text{Xe}$  in curies:  $2.8 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation system at 1400 hours on December 8, 1965, and lasted for 11.9 days.

---

References: (C) (E) (H) (AU) (LB)

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<b>Test:</b>	<b>EMERSON</b>		
<b>Date:</b>	12/16/65	<b>Sponsor:</b>	LRL
<b>Time:</b>	0739 PST	<b>Depth of Burial:</b>	853 ft
<b>Location:</b>	NTS U2al	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** Less than  $7.5 \times 10^{-2}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.7 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $5.4 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $1.6 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $1.7 \times 10^{-2}$

---

**Release Summary:** A test release from the surface ground zero area occurred at H+7.7 minutes and lasted for one minute.

A drillback release from the ventilation system occurred at 1700 hours on December 19, 1965, and lasted for 2.2 days.

---

**References:** (C) (E) (H) (AU) (LC) (MF)

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<b>Test:</b>	<b>MAXWELL</b>		
<b>Date:</b>	01/13/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0737 PST	<b>Depth of Burial:</b>	601 ft
<b>Location:</b>	NTS U9br	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 3.4

$^{133}\text{Xe}$  in curies: 3.0

$^{133\text{m}}\text{Xe}$  in curies:  $7.0 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $3.0 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation system at 0700 hours on January 15, 1966, and lasted for 4.3 days.

---

**References:** (C) (E) (H) (AU) (LD)

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<b>Test:</b>	<b>SIENNA</b>		
<b>Date:</b>	01/18/66	<b>Sponsor:</b>	LASL
<b>Time:</b>	1035 PST	<b>Depth of Burial:</b>	902 ft
<b>Location:</b>	NTS U3cj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $7.4 \times 10^{-3}$

$^{131}\text{I}$  in curies:  $1.6 \times 10^{-3}$

$^{133}\text{I}$  in curies:  $5.6 \times 10^{-3}$

$^{135}\text{I}$  in curies:  $2.0 \times 10^{-4}$

---

**Release Summary:** A drillback release occurred at 0900 hours on January 20, 1966. The above activity was noted on an area air sampler.

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**References:** (B) (E) (H) (AU) (UL)

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<b>Test:</b>	<b>REO</b>		
<b>Date:</b>	01/22/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0717 PST	<b>Depth of Burial:</b>	682 ft
<b>Location:</b>	NTS U10m	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity at R+12 Hours, in Curies:**  $1.0 \times 10^1$

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**Isotopes Identified in the Release:**  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{133}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

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**Drillback Release Activity at Time of Release, in Curies:**  $2.2 \times 10^1$

$^{133}\text{Xe}$  in curies:  $2.1 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $6.1 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.6 \times 10^{-1}$

---

**Release Summary:** A test release occurred from the cables at H+2 hours and lasted for 15 minutes.

A drillback release occurred from the ventilation system beginning at 0943 hours on January 27, 1966, and lasted for 4.5 hours.

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**References:** (C) (E) (H) (AU) (QA)

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<b>Test:</b>	<b>PLAID II</b>		
<b>Date:</b>	02/03/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	1017 PST	<b>Depth of Burial:</b>	886 ft
<b>Location:</b>	NTS U2r	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:** 6.5

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$ ,  $^{139}\text{Xe}$ ,  $^{138}\text{Cs}$ , and  $^{139}\text{Ba}$

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**Drillback Release Activity at Time of Release, in Curies:**  $1.9 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.8 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies:  $8.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 5.1

$^{131}\text{I}$  in curies:  $1.9 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $7.6 \times 10^{-2}$

---

**Release Summary:** A test release from the surface ground zero area occurred at H+20 minutes and lasted for 29 minutes.

Drillback releases occurred from the surface ground zero area at 1445 hours on February 5, 1966, lasting for 3.1 days, and from the ventilation system at 2220 hours on February 5, 1966, lasting for 2.2 days.

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**References:** (C) (E) (H) (AU) (LE) (MG)

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<b>Test:</b>	<b>REX</b>		
<b>Date:</b>	02/24/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0755 PST	<b>Depth of Burial:</b>	2,204 ft
<b>Location:</b>	NTS UE20h	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	19 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.1 \times 10^2$

$^{133}\text{Xe}$  in curies:  $3.0 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 7.1

$^{135}\text{Xe}$  in curies:  $4.6 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation system at 0150 hours on March 2, 1966, and lasted for five days.

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**References:** (C) (E) (H) (AU) (JJ)

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<b>Test:</b>	<b>RED HOT</b>		
<b>Date:</b>	03/05/66	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	1015 PST	<b>Depth of Burial:</b>	1,329 ft
<b>Location:</b>	NTS U12g.06	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Uncontrolled

---

**Uncontrolled Release at R+12 Hours, in Curies:**  $1.0 \times 10^6$

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**Isotopes Identified in the Release:** krypton, xenons,  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

**Cloud Direction:** Northeasterly

**Maximum Activity Detected in Air Offsite:** 0.69 picocuries of gross beta activity per cubic meter of air at Elko, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background were measured.

**Maximum Iodine Level Detected Offsite:** 19 picocuries of <sup>131</sup>I per cubic meter of air, 81 picocuries of <sup>133</sup>I per cubic meter of air at Lathrop Wells, Nevada, and 80 picocuries of <sup>135</sup>I per cubic meter of air at 18 miles west of Clark Station, Nevada, on Highway 6

**Maximum Distance Radiation Detected Offsite:** Ground level readings were not above background radiation levels. However, a cloud tracking mission detected activity in the vicinity of Dubuque, Iowa.

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**Release Summary:** Two releases occurred as follows:

1. An uncontrolled release occurred from H+7 minutes until H+110 minutes. Seepage was observed coming from the portal immediately after zero time. At H+7 minutes, the tunnel ventilation system was turned on and continued to operate until H+110 minutes when it was apparent that the filter system was nonfunctional. The ventilation system was then turned off.
  2. An uncontrolled release occurred at H+2 hours and continued seeping from the tunnel portal until H+20 hours when the majority of the release was over. Seepage from the portal continued for several days but did not significantly contribute to the magnitude of the release. The released effluent was predominantly noble gases, but approximately 2,000 curies of <sup>135</sup>I, 500 curies of <sup>133</sup>I, and 20 curies of <sup>131</sup>I were also observed.
- 

**References:** (B) (D) (E) (H) (L) (P) (R) (Z) (AU) (EH) (EY) (HD) (NY) (PA)

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**Detonation:** **FINFOOT** (simultaneous with CINNAMON, separate holes)

**Date:** 03/07/66 **Sponsor:** LASL

**Time:** 1041 PST **Depth of Burial:** 640 ft

**Location:** NTS U3du **Purpose:** Weapons Related

**Type:** Shaft **Yield:** Less than 20 kt

**Release Detected:** Onsite Only **Type of Release:** Test

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**Test Release at R+12 Hours, in Curies:**  $6.0 \times 10^{-5}$

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**Release Summary:** A test release occurred at H+2 minutes and lasted for approximately ten minutes.

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**References:** (B) (E) (H) (J) (AU)

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**Test: CLYMER**

<b>Date:</b>	03/12/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	1004 PST	<b>Depth of Burial:</b>	1,306 ft
<b>Location:</b>	NTS U9ce	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $4.5 \times 10^2$**  $^{133}\text{Xe}$  in curies:  $3.5 \times 10^2$  $^{133\text{m}}\text{Xe}$  in curies: 8.0 $^{135}\text{Xe}$  in curies:  $9.3 \times 10^1$ 

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**Release Summary:** Drillback releases occurred from the ventilation system at 1900 hours on March 13, 1966, lasting for 2.6 days, and at 1405 hours on March 23, 1966, lasting for six hours.

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**References:** (C) (E) (H) (AU) (LF)

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**Test: TEMPLAR**

<b>Date:</b>	03/24/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0655 PST	<b>Depth of Burial:</b>	495 ft
<b>Location:</b>	NTS U9bt	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at R+12 Hours\*, in Curies:  $7.5 \times 10^{-2}$**  $^{133}\text{Xe}$  in curies:  $2.4 \times 10^{-2}$  $^{133\text{m}}\text{Xe}$  in curies:  $1.0 \times 10^{-3}$  $^{135}\text{Xe}$  in curies:  $5.0 \times 10^{-2}$ 

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**Release Summary:** Two releases occurred from the ventilation line.

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**References:** (C) (E) (H) (AU) (LG)

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\*Drillback release activity at the time of release is not available.

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<b>Test:</b>	<b>STUTZ</b>		
<b>Date:</b>	04/06/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0557 PST	<b>Depth of Burial:</b>	739 ft
<b>Location:</b>	NTS U2ca	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 1.1**

$^{133}\text{Xe}$  in curies:  $7.0 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.8 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $3.9 \times 10^{-1}$

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**Release Summary:** A drillback release occurred from the ventilation system at 1100 hours on April 8, 1966, and lasted for 2.4 days.

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**References:** (C) (E) (H) (AU) (LH)

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<b>Test:</b>	<b>DURYEA</b>		
<b>Date:</b>	04/14/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0613 PST	<b>Depth of Burial:</b>	1,786 ft
<b>Location:</b>	NTS U20a	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	70 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 1.7**

$^{133}\text{Xe}$  in curies: 1.6

$^{133\text{m}}\text{Xe}$  in curies:  $4.8 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $2.5 \times 10^{-2}$

---

**Release Summary:** A drillback release occurred from the ventilation system at 1935 hours on April 17, 1966, and lasted for 1.5 days.

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**References:** (C) (E) (H) (CE) (AU) (LJ)

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**Test: FENTON**

<b>Date:</b>	04/23/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0655 PST	<b>Depth of Burial:</b>	549 ft
<b>Location:</b>	NTS U2m	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	1.4 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $1.7 \times 10^4$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Maximum Activity Detected in Air Offsite:** Fresh fission products were not detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities were detected above background levels.

**Maximum Iodine Level Detected Offsite:** No iodines were detected in any samples.

**Maximum Distance Radiation Detected Offsite:** No radioactivity above background levels was detected by ground monitoring instruments. However, radioactivity was detected by aerial monitoring at Baker, California.

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**Drillback Release Activity at Time of Release, in Curies:**  $1.7 \times 10^3$

$^{133}\text{Xe}$  in curies:  $8.3 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 5.9

$^{135}\text{Xe}$  in curies:  $8.8 \times 10^2$

$^{131}\text{I}$  in curies:  $5.6 \times 10^{-2}$

$^{133}\text{I}$  in curies: 2.4

$^{135}\text{I}$  in curies: 7.3

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**Release Summary:** A test release occurred from the access shaft at H+1.5 minutes, lasting for three minutes.

Drillback releases occurred from the ventilation line at 1400 hours on April 24, 1966, lasting for 24.4 days and from the crater at 1200 hours on April 23, 1966, lasting for 4.8 days.

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**References:** (C) (E) (H) (S) (Z) (AU) (EV) (G0) (J0)

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<b>Test:</b>	<b>PIN STRIPE</b>		
<b>Date:</b>	04/25/66	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	1138 PDT	<b>Depth of Burial:</b>	971 ft
<b>Location:</b>	NTS U11b	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours, in Curies:**  $2.1 \times 10^5$

**Isotopes Identified in the Release:** kryptons, xenons,  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

**Cloud Direction:** Northeasterly; winds shifted 180 degrees by April 27 and radiation was detected as far as Indio, California

**Maximum Activity Detected in Air Offsite:** 25,000 picocuries of gross beta activity per cubic meter of air at Ash Springs, Nevada (populated site); highest concentration in an unpopulated site, 50,000 picocuries of gross beta activity per cubic meter of air at 6.5 miles west of Hancock Summit, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 8.0 mR/h at 18 miles northeast of Groom Lake, Nevada (unpopulated); 1.5 mR/h at Hiko, Nevada (populated)

**Maximum Iodine Level Detected Offsite:** 38,000 picocuries of  $^{135}\text{I}$  per cubic meter of air in Ash Springs, Nevada (populated site); highest concentration at an unpopulated site, 94,000 picocuries of  $^{135}\text{I}$  per cubic meter of air at 18 miles northeast of Groom Lake, Nevada; highest concentration of  $^{131}\text{I}$  in a domestic water supply, 3,900 picocuries per liter from an open tank at Hiko, Nevada; highest concentration of  $^{131}\text{I}$  in a single milk sample, 4,800 picocuries per liter, and highest concentration of  $^{133}\text{I}$ , 12,000 picocuries per liter at Schofield Dairy at Hiko, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.05 mR/h at Pioche, Nevada

**Release Summary:** Test releases from a fissure near surface ground zero occurred at H+1 minute and at H+7 hours. The releases lasted for 3.5 minutes and 14 hours, respectively. Gross fission products were released as a result of this venting.

**References:** (B) (D) (E) (H) (L) (M) (P) (R) (Z) (AU) (DL) (DM) (E2) (LK) (LL) (PB)

<b>Test:</b>	<b>TRAVELER</b>		
<b>Date:</b>	05/04/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0632 PDT	<b>Depth of Burial:</b>	646 ft
<b>Location:</b>	NTS U2cd	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.7 \times 10^2$**  $^{133}\text{Xe}$  in curies:  $1.7 \times 10^2$  $^{133\text{m}}\text{Xe}$  in curies:  $6.3 \times 10^{-1}$  $^{135}\text{Xe}$  in curies: 2.8

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**Release Summary:** A drillback release occurred from the ventilation system at 1315 on May 6, 1966, and lasted for 2.1 days.

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**References:** (C) (E) (H) (AU) (LM)

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**Test: TAPESTRY**

<b>Date:</b>	05/12/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	1237 PDT	<b>Depth of Burial:</b>	811 ft
<b>Location:</b>	NTS U2an	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:  $6.2 \times 10^3$** 

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**Drillback Release Activity at Time of Release, in Curies:  $2.4 \times 10^3$**  $^{133}\text{Xe}$  in curies:  $1.5 \times 10^3$  $^{133\text{m}}\text{Xe}$  in curies:  $3.2 \times 10^1$  $^{135}\text{Xe}$  in curies:  $8.5 \times 10^2$ 

---

**Release Summary:** A test release from the surface ground zero area occurred at approximately H+1.1 hours and lasted for 57.3 hours.

A drillback release from the ventilation line occurred at 1600 hours on May 13, 1966, and lasted for 49.5 days.

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**References:** (C) (E) (H) (P) (AU) (LN)

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**Test: DUMONT**

<b>Date:</b>	05/19/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0656 PDT	<b>Depth of Burial:</b>	2,201 ft
<b>Location:</b>	NTS U2t	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.5 \times 10^1$

$^{133}\text{Xe}$  in curies:  $3.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $5.4 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 0630 hours on May 26, 1966, and lasted for 13.2 days.

---

**References:** (C) (E) (H) (AU) (LO)

---

<b>Test:</b>	<b>PILE DRIVER</b>		
<b>Date:</b>	06/02/66	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	0830 PDT	<b>Depth of Burial:</b>	1,519 ft
<b>Location:</b>	NTS U15a.01	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	62 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Uncontrolled

---

**Uncontrolled Release at R+12 Hours, in Curies:**  $3.7 \times 10^4$

**Isotopes Identified in the Release:**  $^{135}\text{Xe}$

---

**Release Summary:** An uncontrolled test release occurred as the result of seepage from the surface ground zero area at H+12 hours and lasted for 11 hours.

---

**References:** (B) (E) (H) (L) (P) (R) (AU) (LP)

---

<b>Test:</b>	<b>DOUBLE PLAY</b>		
<b>Date:</b>	06/15/66	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,050 ft
<b>Location:</b>	NTS U16a.03	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite (Uncontrolled Only)	<b>Type of Release:</b>	Controlled, Uncontrolled and Drillback

---

**Controlled Release Activity at Time of Release, in Curies:**  $4.0 \times 10^4$

**Controlled Release Activity at R+12 Hours, in Curies:**  $2.6 \times 10^4$

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**Uncontrolled Release at R+12 Hours, in Curies:**  $8.0 \times 10^5$

---

**Isotopes Identified in the Release:** Noble gases and radioiodines

**Cloud Direction:** Northeasterly for about 200 miles

**Maximum Activity Detected in Air Offsite:** 0.83 picocuries of gross beta activity per cubic meter of air at Hiko, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above normal background levels were measured.

**Maximum Iodine Level Detected Offsite:** 1.9 picocuries of  $^{131}\text{I}$  per cubic meter of air, 1.2 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 5.6 picocuries of  $^{135}\text{I}$  per cubic meter of air at Hiko, Nevada

**Maximum Distance Radiation Detected Offsite:** No radiation readings above background levels were measured.

---

**Drillback Release Activity at Time of Release, in Curies:**  $9.1 \times 10^{-1}$   
 $^{133}\text{Xe}$  in curies:  $9.1 \times 10^{-1}$

---

**Release Summary:** Four test releases occurred as follows:

1. Seepage from cable holes occurred at H+12 minutes until H+28 hours. Primarily noble gases were released.
2. Leakage from the portal occurred at H+5 minutes until H+50 hours. Noble gases and radioiodines were released.
3. A controlled ventilation of the tunnel complex with effluent passing through the filter system occurred at H+50 hours until H+51.6 hours.
4. A controlled ventilation of the tunnel complex was restarted at H+53.6 hours because of a buildup of explosive gases, and ventilation continued until the tunnel was cleared.

A drillback release from the vent line occurred at 1800 hours on August 2, 1966, and lasted for four days.

---

**References:** (C) (D) (E) (H) (L) (P) (R) (X) (Z) (AU) (EI) (EJ) (HE) (LR)

---

<b>Test:</b>	<b>KANKAKEE</b>		
<b>Date:</b>	06/15/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	1102 PDT	<b>Depth of Burial:</b>	1,494 ft
<b>Location:</b>	NTS U10p	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^2$   
 $^{133}\text{Xe}$  in curies:  $1.5 \times 10^2$   
 $^{133\text{m}}\text{Xe}$  in curies: 4.2  
 $^{135}\text{Xe}$  in curies: 3.6

---

**Release Summary:** A drillback release occurred from the ventilation line at 0730 hours on June 17, 1966, and lasted for five days.

---

**References:** (C) (E) (H) (AU) (LQ)

---

**Test:** **VULCAN**

<b>Date:</b>	06/25/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	1013 PDT	<b>Depth of Burial:</b>	1,057 ft
<b>Location:</b>	NTS U2bd	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	25 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.5 \times 10^2$

$^{133}\text{Xe}$  in curies:  $6.3 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 2.9

$^{135}\text{Xe}$  in curies:  $1.8 \times 10^2$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1100 hours June 27, 1966, and lasted for 2.4 days.

---

**References:** (C) (E) (H) (AU) (LS)

---

**Test:** **SAXON**

<b>Date:</b>	07/28/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0833 PDT	<b>Depth of Burial:</b>	502 ft
<b>Location:</b>	NTS U2cc	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.0 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $3.8 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $1.2 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 0045 hours on July 29, 1966, and lasted for 3.1 days.

---

**References:** (C) (E) (H) (AU) (LT)

---

<b>Test:</b>	<b>ROVENA</b>		
<b>Date:</b>	08/10/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0616 PDT	<b>Depth of Burial:</b>	641 ft
<b>Location:</b>	NTS U10s	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 1.9**

$^{133}\text{Xe}$  in curies: 1.0

$^{133\text{m}}\text{Xe}$  in curies:  $4.1 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $8.3 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1500 hours on August 12, 1966, and lasted for 20 hours.

---

**References:** (C) (E) (H) (AV) (LU) (LV)

<b>Test:</b>	<b>DERRINGER</b>		
<b>Date:</b>	09/12/66	<b>Sponsor:</b>	DoD/SC/LASL
<b>Time:</b>	0830 PDT	<b>Depth of Burial:</b>	837 ft
<b>Location:</b>	NTS U5i	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	7.8 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $1.2 \times 10^4$

---

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , kryptons, and xenons

**Cloud Direction:** Northeasterly for about 150 miles until the cloud was undetectable

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** 0.003 mR/h at Hancock Summit, Nevada, and ten miles southeast of Coyote Summit, Nevada

**Maximum Iodine Level Detected Offsite:** No iodine was detected.

**Maximum Distance Radiation Detected Offsite:** 0.003 mR/h at Hancock Summit, Nevada, and at ten miles southeast of Coyote Summit, Nevada

---

**Release Summary:** Test releases from the shaft area occurred at H+1 minute and at H+50 minutes and lasted for 14 minutes and 47.1 hours, respectively. The effluent contained

noble gases and radioiodines (152 curies of  $^{135}\text{I}$ , 41 curies of  $^{133}\text{I}$ , and 1.5 curies of  $^{131}\text{I}$  at the time of release).

---

**References:** (B) (D) (E) (H) (L) (M) (P) (R) (Z) (AV) (FD) (HF) (HG) (LW)

---

**Test:** **NEWARK**

<b>Date:</b>	09/29/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0745 PDT	<b>Depth of Burial:</b>	750 ft
<b>Location:</b>	NTS U10u	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.9 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.6 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 7.0

$^{135}\text{Xe}$  in curies:  $1.2 \times 10^2$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1850 hours on October 1, 1966, and lasted for 15 minutes.

---

**References:** (C) (E) (H) (AV) (LX)

---

**Test:** **SIMMS**

<b>Date:</b>	11/05/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0645 PST	<b>Depth of Burial:</b>	650 ft
<b>Location:</b>	NTS U10w	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.1 \times 10^1$

$^{133}\text{Xe}$  in curies: 8.5

$^{133\text{m}}\text{Xe}$  in curies:  $4.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 1.9

$^{131}\text{I}$  in curies:  $9.0 \times 10^{-3}$

$^{133}\text{I}$  in curies:  $1.8 \times 10^{-2}$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 1725 hours on November 6, 1966, lasting for 46 hours, and from the drilling rig at 0705 hours on November 7, 1966, lasting for 47.7 hours.

---

**References:** (C) (E) (H) (AU) (LY)

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<b>Test:</b>	<b>AJAX</b>		
<b>Date:</b>	11/11/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0400 PST	<b>Depth of Burial:</b>	782 ft
<b>Location:</b>	NTS U9al	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $4.4 \times 10^{-1}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $9.0 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $7.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $2.0 \times 10^{-1}$

---

**Release Summary:** Test releases occurred from the surface ground zero area at H+12 minutes, lasting for four minutes, and from cables at the Red Shack area at H+33 minutes, lasting for four minutes.

A drillback release from the ventilation line occurred at 0240 hours on November 15, 1966, and lasted for five minutes.

---

**References:** (C) (E) (H) (AV) (LZ)

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<b>Test:</b>	<b>CERISE</b>		
<b>Date:</b>	11/18/66	<b>Sponsor:</b>	LASL
<b>Time:</b>	0702 PST	<b>Depth of Burial:</b>	692 ft
<b>Location:</b>	NTS U3eu	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:** 0

---

**Isotopes Identified in the Release:** xenons, kryptons, and  $^{88}\text{Rb}$

---

**Release Summary:** No test release was detectable, but an air sample taken inside the surface ground zero casing showed detectable xenon, krypton, and rubidium-88.

---

**References:** (B) (E) (H) (AV) (TX)

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<b>Test:</b>	<b>VIGIL</b>		
<b>Date:</b>	11/22/66	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	299 ft
<b>Location:</b>	NTS U10ad	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $1.4 \times 10^{-3}$

---

**Release Summary:** A test release occurred from the surface ground zero area at H+4 minutes and lasted for six minutes.

---

**References:** (C) (E) (H) (AV) (V3)

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<b>Test:</b>	<b>SIDECAR</b>		
<b>Date:</b>	12/13/66	<b>Sponsor:</b>	LASL
<b>Time:</b>	0950 PST	<b>Depth of Burial:</b>	788 ft
<b>Location:</b>	NTS U3ez	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $4.1 \times 10^{-2}$

---

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

---

**Release Summary:** All activity from this release was attributed to the catcher pull.

---

**References:** (B) (E) (H) (AV) (UK)

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<b>Test:</b>	<b>NEW POINT</b>		
<b>Date:</b>	12/13/66	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1300 PST	<b>Depth of Burial:</b>	784 ft
<b>Location:</b>	NTS U11c	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:** 3.0

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**Release Summary:** Seepage from the surface ground zero area occurred at H+7 hours through H+9 hours. Primarily noble gases were released.

---

**References:** (C) (E) (H) (L) (X) (L0) (AV)

---

<b>Test:</b>	<b>NASH</b>		
<b>Date:</b>	01/19/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0845 PST	<b>Depth of Burial:</b>	1,194 ft
<b>Location:</b>	NTS U2ce	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	39 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $6.9 \times 10^4$

---

**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Cloud Direction:** Southwesterly; within a few miles aircraft could not detect the cloud

**Maximum Activity Detected in Air Offsite:** 2.6 picocuries of gross beta activity per cubic meter of air at Nyala, Nevada\*

**Maximum Gamma Exposure Rate Detected Offsite:** 0.14 mR/h at 21 miles west of the Mercury turnoff on Highway 95 (Nevada)\*

**Maximum Iodine Level Detected Offsite:** 1.2 picocuries of  $^{131}\text{I}$  per cubic meter of air at Clark Station, Nevada\*

**Maximum Distance Radiation Detected Offsite:** 0.01 mR/h at the Diablo Maintenance Station, Nevada (exposure rate recorder measurement)

---

**Release Summary:** A test release from the surface ground zero area of the crater began at H+9.25 hours on January 19, 1967, and lasted for 41 hours.

---

**References:** (C) (D) (E) (H) (P) (Z) (AV) (DN) (HH) (M0)

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\*Data recorded was attributed to radioactive debris from an atmospheric Chinese nuclear test conducted on December 27, 1966.

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<b>Test:</b>	<b>RIVET II</b>		
<b>Date:</b>	01/26/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	646 ft
<b>Location:</b>	NTS U10z	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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---

**Test Release Activity at R+12 Hours, in Curies:**  $5.8 \times 10^{-2}$

---

**Release Summary:** A test release occurred from the surface ground zero area at zero time and lasted for 20 minutes.

---

**References:** (C) (E) (H) (AV) (UE)

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<b>Test:</b>	<b>RIVET III</b>		
<b>Date:</b>	03/02/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	890 ft
<b>Location:</b>	NTS U10y	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release:** Trace

iodines: trace

---

**Release Summary:** A drillback release occurred from the ventilation system at 1535 hours on March 7, 1967, and lasted for 63 hours.

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**References:** (C) (E) (H) (X) (AV) (MI)

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<b>Test:</b>	<b>MUSHROOM</b>		
<b>Date:</b>	03/03/67	<b>Sponsor:</b>	LASL
<b>Time:</b>	0719 PST	<b>Depth of Burial:</b>	587 ft
<b>Location:</b>	NTS U3ef	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $3.8 \times 10^{-1}$

---

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{135}\text{Xe}$

---

**Release Summary:** All activity from this release was attributed to the catcher pull.

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**References:** (B) (E) (H) (AV) (V4)

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**Test: OAKLAND**

<b>Date:</b>	04/04/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0620 PST	<b>Depth of Burial:</b>	542 ft
<b>Location:</b>	NTS U2bi	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^2$  $^{133}\text{Xe}$  in curies:  $2.2 \times 10^1$  $^{133\text{m}}\text{Xe}$  in curies: 1.1 $^{135}\text{Xe}$  in curies:  $8.1 \times 10^1$ 

---

**Release Summary:** Nine intermittent drillback releases occurred from the ventilation line system beginning at 1510 hours on April 5, 1967, and lasting for a total of approximately 4 hours over a 30-hour period.

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**References:** (C) (E) (H) (AV) (V5)

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**Test: HEILMAN**

<b>Date:</b>	04/06/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	499 ft
<b>Location:</b>	NTS U2cg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release Activity at R+12 Hours, in Curies:**  $3.1 \times 10^{-2}$ **Drillback Release Activity at Time of Release, in Curies:** 8.3 $^{133}\text{Xe}$  in curies: 8.1 $^{133\text{m}}\text{Xe}$  in curies:  $1.5 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $1.2 \times 10^{-3}$ 

---

**Release Summary:** A test release occurred from the surface ground zero area at zero time and lasted for 41 minutes.

A drillback release occurred from the ventilation system at 1735 hours on April 14, 1967, and lasted for 45 minutes.

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**References:** (C) (E) (H) (X) (AV) (V6)

**Test: COMMODORE**

<b>Date:</b>	05/20/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	2,449 ft
<b>Location:</b>	NTS U2am	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	250 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** Less than 1.0

iodines: trace

---

**Release Summary:** A drillback release occurred from the drilling rig cellar at 1705 hours on May 28, 1967, and lasted for 70 minutes.

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**References:** (C) (E) (H) (AV) (M2)

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**Test: KNICKERBOCKER**

<b>Date:</b>	05/26/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	2,069 ft
<b>Location:</b>	NTS U20d	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	76 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.1 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.1 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies:  $1.8 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation system at 0115 hours on June 16, 1967, and lasted for 5.6 days.

---

**References:** (C) (E) (H) (AV) (M3)

---

**Test: SWITCH**

<b>Date:</b>	06/22/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0610 PDT	<b>Depth of Burial:</b>	990 ft
<b>Location:</b>	NTS U9bv	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** Less than 1.0

$^{133}\text{Xe}$  in curies: less than 1.0  
iodines: trace

---

**Release Summary:** A drillback release occurred from the drilling rig cellar at 0725 hours on June 30, 1967, and lasted for 8.6 hours.

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**References:** (C) (E) (H) (AV) (M4)

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<b>Test:</b>	<b>MIDI MIST</b>		
<b>Date:</b>	06/26/67	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	1,240 ft
<b>Location:</b>	NTS U12n.02	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite (Controlled Only)	<b>Type of Release:</b>	Controlled and Drillback

---

**Controlled Release Activity at Time of Release, in Curies:**  $4.5 \times 10^3$

**Controlled Release Activity at R+12 Release, in Curies:**  $1.3 \times 10^3$

---

**Isotopes Identified in the Release:**  $^{85}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Cloud Direction:** Northerly

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities were detected above background levels.

**Maximum Iodine Level Detected Offsite:** No iodines were detected.

**Maximum Distance Radiation Detected Offsite:** Northerly, toward the east side of the crest of the Belted Range, just off the NTS

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.8 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.8 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $1.7 \times 10^{-2}$

---

**Release Summary:** A controlled, filtered ventilation of the tunnel complex occurred from H+4.67 hours until H+24 hours. Radioactivity was detected off the NTS by aircraft only.

A drillback release from the ventilation line occurred at 0220 hours on July 22, 1967, and lasted for about one hour.

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**References:** (C) (E) (H) (L) (P) (X) (AV) (EK) (HI) (HJ) (M5)

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**Test: UMBER**

<b>Date:</b>	06/29/67	<b>Sponsor:</b>	LASL
<b>Time:</b>	0425 PDT	<b>Depth of Burial:</b>	1,017 ft
<b>Location:</b>	NTS U3em	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	10 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $2.6 \times 10^4$

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Cloud Direction:** Southwesterly; tracked by aircraft for 90 to 100 miles where it became undetectable

**Maximum Activity Detected in Air Offsite:** 0.25 picocuries of gross beta activity per cubic meter of air at 10 miles east of Lathrop Wells, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.7 mR/h at the junction of Highway 95 and State Road 16 (Ash Meadows, Nevada turnoff)

**Maximum Iodine Level Detected Offsite:** 80 picocuries of  $^{135}\text{I}$  per cubic meter of air and 8.0 picocuries of  $^{133}\text{I}$  per cubic meter of air 10 miles east of Lathrop Wells, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.03 to 0.1 mR/h at Death Valley Junction and Shoshone, California

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**Release Summary:** A test release from the LOS pipe occurred at H+17 minutes and lasted for six days.

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**References:** (B) (D) (E) (H) (P) (Z) (AV) (HK) (J3)

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**Test: STANLEY**

<b>Date:</b>	07/27/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	1,587 ft
<b>Location:</b>	NTS U10q	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.7 \times 10^1$

$^{133}\text{Xe}$  in curies:  $3.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.1

$^{135}\text{Xe}$  in curies:  $5.3 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 2125 hours on July 31, 1967, and lasted for 2.7 days.

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**References:** (C) (E) (H) (AW) (M6)

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**Test:** **WASHER**

<b>Date:</b>	08/10/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0710 PDT	<b>Depth of Burial:</b>	1,536 ft
<b>Location:</b>	NTS U10r	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $4.7 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $3.6 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $1.5 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $9.2 \times 10^{-2}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 0613 hours on August 13, 1967, and lasted for ten minutes.

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**References:** (C) (E) (H) (AW) (M7)

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**Test:** **LEXINGTON**

<b>Date:</b>	08/24/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	741 ft
<b>Location:</b>	NTS U2bm	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling and Drillback

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.1 \times 10^3$

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**Isotopes Identified in the Release:**  $^{88}\text{Kr}$  and  $^{135}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.3 \times 10^1$

$^{133}\text{Xe}$  in curies: 1.8

$^{133\text{m}}\text{Xe}$  in curies:  $4.4 \times 10^{-2}$

$^{135}\text{Xe}$  in curies: 1.2

other, in curies:  $1.0 \times 10^1$

---

**Release Summary:** A release occurred during postshot gas sampling operations between 0845 hours and 1300 hours on August 24, 1967.

A drillback release occurred from the ventilation line at 1737 hours on August 25, 1967, and lasted for 22 minutes. A second release occurred from the "blooie" line (a hose used in the drilling circulation system), accounting for 10 curies of the total release.

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**References:** (C) (E) (H) (X) (AW) (QB)

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<b>Test:</b>	<b>DOOR MIST</b>		
<b>Date:</b>	08/31/67	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	0930 PDT	<b>Depth of Burial:</b>	1,463 ft
<b>Location:</b>	NTS U12g.07	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Controlled and Uncontrolled

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**Controlled Release Activity at Time of Release, in Curies:**  $6.9 \times 10^5$

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**Controlled Release Activity at R+12, in Curies:**  $3.5 \times 10^5$

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**Isotopes Detected in Release:**  $^{103}\text{Ru}$ ,  $^{106}\text{Ru}/^{106}\text{Rh}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{135}\text{Xe}$

---

**Uncontrolled Release at R+12 Hours, in Curies:**  $5.0 \times 10^4$

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**Isotopes Identified in the Release:**  $^{103}\text{Ru}$ ,  $^{106}\text{Ru}/^{106}\text{Rh}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{Xe}$

**Cloud Direction:** Northerly; tracked by aircraft for about 60 miles after which the cloud became undetectable

**Maximum Activity Detected in Air Offsite:** 0.08 picocuries of gross beta activity per cubic meter of air at Diablo, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.01 mR/h at Diablo, Nevada

**Maximum Iodine Level Detected Offsite:** 2 picocuries of  $^{133}\text{I}$  per cubic meter of air and 2.3 picocuries of  $^{135}\text{I}$  per cubic meter of air at Diablo, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.003 mR/h at Clark Station, Nevada

---

**Release Summary:** Test releases occurred as follows:

1. Seepage occurred from H+0.5 until H+24 hours through cables to the cable splice building on the mesa. Release to the atmosphere (primarily noble gases) was noted from the cable splice building.
2. Releases from the tunnel portal were from H+1.5 until H+3.5 hours and from H+6.2 until H+8 hours. These releases consisted primarily of the volatile fraction of gross fission products (noble gases, iodines, and rutheniums).

3. Releases during controlled, filtered ventilation of the tunnel complex occurred from H+3.5 until H+5.6 hours and from H+8 until H+72 hours. Effluent consisted of primarily noble gases with small quantities of  $^{135}\text{I}$ ,  $^{133}\text{I}$ ,  $^{131}\text{I}$ ,  $^{103}\text{Ru}$ , and  $^{106}\text{Ru}/^{106}\text{Rh}$ .

**References:** (B) (D) (E) (H) (K) (L) (P) (Z) (AW) (EL) (EM) (HL) (HM) (M8) (M9)

<b>Test:</b>	<b>YARD</b>		
<b>Date:</b>	09/07/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0645 PDT	<b>Depth of Burial:</b>	1,708 ft
<b>Location:</b>	NTS U10af	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $2.9 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $1.9 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $8.2 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $8.9 \times 10^{-2}$

**Release Summary:** Drillback releases occurred from the ventilation line at 2220 hours on September 9, 1967, lasting for two minutes, and at 0135 hours on September 10, 1967, lasting for three minutes.

**References:** (C) (E) (H) (AW) (L1)

<b>Test:</b>	<b>GILROY</b>		
<b>Date:</b>	09/15/67	<b>Sponsor:</b>	LASL
<b>Time:</b>	1030 PDT	<b>Depth of Burial:</b>	787 ft
<b>Location:</b>	NTS U3ex	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release:** Trace

iodines: trace

**Release Summary:** A predrillback release began at 0840 hours on October 4, 1967. Traces of iodine were noted during the cable cutting. A drillback release occurred at 2125 hours on October 8, 1967.

**References:** (B) (E) (H) (AW) (V7)

**Test: MARVEL**

<b>Date:</b>	09/21/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	1345 PDT	<b>Depth of Burial:</b>	572 ft
<b>Location:</b>	NTS U10dS1	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	2.2 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

---

**Test Release at R+12 Hours, in Curies:**  $2.7 \times 10^1$

---

**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{135}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:** 1.0

**Release Summary:** A test release from Cable Hole No. 5 occurred at 1850 hours on September 21, 1967, and lasted for 3.8 hours.

A drillback release from the drilling mud "blooie" line occurred at 1030 hours on September 23, 1967, and lasted for five days.

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**References:** (C) (E) (H) (AW) (N0)

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**Test: LANPHER**

<b>Date:</b>	10/18/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	2,343 ft
<b>Location:</b>	NTS U2x	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 5.3

$^{133}\text{Xe}$  in curies: 5.2

$^{133\text{m}}\text{Xe}$  in curies:  $8.6 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $1.8 \times 10^{-4}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 0400 hours on October 27, 1967, and lasted for 2.1 hours.

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**References:** (C) (E) (H) (AW) (N1)

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**Test: COGNAC**

<b>Date:</b>	10/25/67	<b>Sponsor:</b>	LASL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	787 ft
<b>Location:</b>	NTS U3fm	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $6.4 \times 10^{-2}$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

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**Release Summary:** All activity released was attributed to the cable pull. The release lasted for three days.

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**References:** (B) (E) (H) (AW)

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**Test: SAZERAC**

<b>Date:</b>	10/25/67	<b>Sponsor:</b>	LASL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	988 ft
<b>Location:</b>	NTS U3fa	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.2 \times 10^{-2}$

$^{131}\text{I}$  in curies:  $4.9 \times 10^{-3}$

$^{132}\text{I}$  in curies:  $1.7 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $2.7 \times 10^{-2}$

$^{135}\text{I}$  in curies:  $3.0 \times 10^{-3}$

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**Release Summary:** A drillback release occurred on October 26, 1967.

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**References:** (B) (E) (H) (AW) (OY)

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**Test: WORTH**

<b>Date:</b>	10/25/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0745 PDT	<b>Depth of Burial:</b>	614 ft
<b>Location:</b>	NTS U10ag	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^1$

$^{133}\text{Xe}$  in curies:  $3.4 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.3

$^{135}\text{Xe}$  in curies: 4.6

---

**Release Summary:** A drillback release occurred from the ventilation line at 1800 hours on October 28, 1967, and lasted for 40 minutes.

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**References:** (C) (E) (H) (AW) (UA)

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**Test: POLKA**

<b>Date:</b>	12/06/67	<b>Sponsor:</b>	LRL
<b>Time:</b>	0500 PST	<b>Depth of Burial:</b>	623 ft
<b>Location:</b>	NTS U10ai	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling and Drillback

---

**Gas Sampling Activity at Time of Release, in Curies:**  $3.0 \times 10^2$

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**Isotopes Identified in the Release:**  $^{135}\text{Xe}$

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**Drillback Release Activity at Time of Release, in Curies:**  $7.5 \times 10^1$

$^{133}\text{Xe}$  in curies:  $2.0 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $6.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $5.4 \times 10^1$

---

**Release Summary:** A release occurred during a prompt gas sampling operation on December 6, 1967, and lasted from 0725 to 1400 hours.

Four intermittent drillback releases occurred from the ventilation line starting at 1228 hours and lasting until 1715 hours on December 7, 1967, with a total release time of 1.7 hours, and two intermittent drillback releases occurred from the ventilation line starting at 0910 hours and lasting until 1025 hours on December 19, 1967, with a total release time of 50 minutes.

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**References:** (C) (E) (H) (AW) (QC)

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<b>Test:</b>	<b>HUPMOBILE</b>		
<b>Date:</b>	01/18/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0830 PST	<b>Depth of Burial:</b>	810 ft
<b>Location:</b>	NTS U2y	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	7.4 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $1.2 \times 10^5$

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

**Cloud Direction:** Southwesterly, tracked by aircraft to the Death Valley, California, area where the cloud became undetectable

**Maximum Activity Detected in Air Offsite:** 1,100 picocuries of gross beta activity per cubic meter of air at Dansby's Ranch, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 0.7 mR/h near Dansby's Ranch in the Amargosa Farm Area, Nevada

**Maximum Iodine Level Detected Offsite:** 1,600 picocuries of  $^{135}\text{I}$  per cubic meter of air at Dansby's Ranch, Nevada; maximum  $^{133}\text{I}$  concentration in milk, 110 picocuries per liter at Hord Ranch, Lathrop Wells, Nevada; maximum  $^{131}\text{I}$  concentration in milk, 30 picocuries per liter at Rooker Ranch, Lathrop Wells, Nevada; maximum  $^{131}\text{I}$  concentration on a cow feed sample, 480 picocuries per kilogram at Rooker Ranch, Lathrop Wells, Nevada

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**Release Summary:** Venting from the LOS pipe at the surface ground zero area occurred at H+1.6 minutes and lasted for approximately 100 minutes.

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**References:** (C) (D) (E) (H) (M) (P) (Z) (AW) (EN) (EO) (HN) (N2)

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<b>Test:</b>	<b>STACCATO</b>		
<b>Date:</b>	01/19/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	1,455 ft
<b>Location:</b>	NTS U10ah	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 8.2**

$^{133}\text{Xe}$  in curies: 2.9

$^{133\text{m}}\text{Xe}$  in curies:  $1.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 5.2

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**Release Summary:** A drillback release occurred from the ventilation line at 0150 hours on January 21, 1968, and lasted for 27 hours, 45 minutes.

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**References:** (C) (E) (H) (AW) (N3)

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**Test: BRUSH**

<b>Date:</b>	01/24/68	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	388 ft
<b>Location:</b>	NTS U3eq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:  $2.0 \times 10^{-5}$**

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$  and  $^{138}\text{Cs}$

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**Release Summary:** A test release occurred at H+3 minutes from surface ground zero and lasted for five minutes.

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**References:** (B) (E) (H) (AW) (U3)

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**Test: CABRIOLET**

<b>Date:</b>	01/26/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	170 ft
<b>Location:</b>	NTS U201	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Crater	<b>Yield:</b>	2.3 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Crater

---

**Test Release at R+12 Hours, in Curies:  $2.2 \times 10^5$**

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{91}\text{Sr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{134}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{187}\text{W}$

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**Cloud Direction:** Northerly into southern Idaho, then northeast as far as Big Timber Mountain, Montana

**Maximum Activity Detected in Air Offsite:** 33,000 picocuries of gross beta activity per cubic meter of air at Stone Cabin Ranch, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 65 mR/h at Clark Station, Nevada

**Maximum Iodine Level Detected Offsite:** 360 picocuries of  $^{131}\text{I}$  per cubic meter of air and 5,400 picocuries of  $^{133}\text{I}$  per cubic meter of air at Stone Cabin Ranch, Nevada; 630 picocuries of  $^{131}\text{I}$  per liter in milk at Mountain View Ranch, Deeth, Nevada

**Maximum Distance Radiation Detected Offsite:** Detected on an air sampler at Wells, Nevada

**Release Summary:** The planned test release from the surface ground zero area occurred at H time and lasted for one minute.

**References:** (C) (E) (H) (AW) (DO) (DY) (DZ) (EP) (HP) (HQ)

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<b>Test:</b>	<b>KNOX</b>		
<b>Date:</b>	02/21/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	2,116 ft
<b>Location:</b>	NTS U2at	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.4 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 4.4

$^{135}\text{Xe}$  in curies: 8.0

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**Release Summary:** Drillback releases occurred from the ventilation line at 2340 hours on February 24, 1968, lasting for three hours and five minutes, and at 1720 hours on February 27, 1968, lasting for three days.

**References:** (C) (E) (H) (AW) (N4)

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<b>Test:</b>	<b>RUSSET</b>		
<b>Date:</b>	03/05/68	<b>Sponsor:</b>	LASL/DoD
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	393 ft
<b>Location:</b>	NTS U6a	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Vertical Shaft/ Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Special Packaging Operation

---

**Test Release Activity at R+12 Hours, in Curies:**  $2.9 \times 10^1$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{138}\text{Xe}$

---

**Release Activity During Special Packaging Operation at Time of Release, in Curies:**  $5.9 \times 10^{-5}$

$^{235}\text{U}$  in curies:  $2.4 \times 10^{-5}$

$^{238}\text{U}$  in curies:  $3.5 \times 10^{-5}$

---

**Release Summary:** A release occurred at H time and during a special packaging operation on April 23-24, 1974.

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**References:** (B) (E) (H) (AW) (EZ) (ST)

---

**Detonations:** **BUGGY-A, -B, -C, -D, -E** (simultaneous, separate holes)

**Date:** 03/12/68 **Sponsor:** LRL

**Time:** 0904 PST **Depth of Burial:** 135 ft each

**Location:** NTS U30a-e **Purpose:** Plowshare

**Type:** Crater **Yield:** 1.08 kt each  
(5.4 kt total)

**Release Detected:** Offsite **Type of Release:** Test/Crater

---

**Test Release at R+12 Hours, in Curies:**  $1.2 \times 10^6$

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**Isotopes Identified in the Release:**  $^{91}\text{Sr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{132}\text{Te}$ ,  $^{140}\text{Ba}$ , and  $^{187}\text{W}$

**Cloud Direction:** Northerly; tracked as far north as Montana

**Maximum Activity Detected in Air Offsite:** 12,000 picocuries of gross beta activity per cubic meter of air at Warm Springs, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 8.5 mR/h at four miles east of Warm Springs (unpopulated area); 1.5 mR/h at Warm Springs, Nevada (populated)

**Maximum Iodine Level Detected Offsite:** 4,300 picocuries of  $^{135}\text{I}$  per cubic meter of air, 920 picocuries of  $^{133}\text{I}$  per cubic meter of air, and 97 picocuries of  $^{131}\text{I}$  per cubic meter of air at Warm Springs, Nevada; highest concentration of  $^{131}\text{I}$  in milk, 550 picocuries per liter in samples collected near Wells, Nevada, on March 15 and 16, 1968; second highest concentration of  $^{131}\text{I}$  in milk, 100 picocuries per liter in a sample collected near Pancake Summit, Nevada, on March 15, 1968

**Maximum Distance Radiation Detected Offsite:** 0.15 mR/h on Highway 40 in Wells, Nevada

---

**Release Summary:** The planned test release from the surface ground zero area occurred at H time lasted for 2.5 minutes. It was not determined which detonation(s) released effluent.

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**References:** (C) (E) (H) (AW) (DP) (DY)

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**Test:** **MILK SHAKE**

<b>Date:</b>	03/25/68	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1045 PST	<b>Depth of Burial:</b>	869 ft
<b>Location:</b>	NTS U5k	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $3.0 \times 10^1$

---

**Isotopes Identified in the Release:**  $^{138}\text{Xe}$

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**Release Summary:** Seepage from a downhole cable occurred from H+7 minutes until H+1 hour.

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**References:** (E) (H) (L) (AW) (E0)

---

**Detonation:** **NOOR** (simultaneous with THROW, separate holes)

<b>Date:</b>	04/10/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0600 PST	<b>Depth of Burial:</b>	1,253 ft
<b>Location:</b>	NTS U2be	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 1.4

$^{133}\text{Xe}$  in curies: 1.2

$^{133\text{m}}\text{Xe}$  in curies:  $4.4 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $2.2 \times 10^{-1}$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 1340 hours on April 12, 1968, lasting for 40 minutes, and at 1400 hours on April 14, 1968, lasting for 30 minutes.

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**References:** (C) (E) (H) (AW) (UZ)

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**Test: SHUFFLE**

<b>Date:</b>	04/18/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0605 PST	<b>Depth of Burial:</b>	1,619 ft
<b>Location:</b>	NTS U10t	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.9 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.8 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $5.5 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $3.5 \times 10^{-1}$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 2330 hours on April 21, 1968, lasting for 110 minutes, and at 1315 hours on April 23, 1968, lasting for 70 minutes.

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**References:** (C) (E) (H) (AW) (N5)

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**Test: SCROLL**

<b>Date:</b>	04/23/68	<b>Sponsor:</b>	LRL/ARPA
<b>Time:</b>	0901 PST	<b>Depth of Burial:</b>	750 ft
<b>Location:</b>	NTS U19n	<b>Purpose:</b>	Vela Uniform
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $1.8 \times 10^4$

---

**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{137}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

---

**Release Summary:** A test release from surface ground zero, Satellite No. 1, occurred at H+184 minutes.

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**References:** (C) (E) (H) (AW)

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<b>Test:</b>	<b>CROCK</b>		
<b>Date:</b>	05/08/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0710 PDT	<b>Depth of Burial:</b>	594 ft
<b>Location:</b>	NTS U10ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.4 \times 10^2$

$^{133}\text{Xe}$  in curies:  $9.6 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 4.1

$^{135}\text{Xe}$  in curies:  $3.7 \times 10^1$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 0220 hours on May 11, 1968, lasting for 115 minutes, and at 1300 hours on the same day, lasting for one hour.

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**References:** (C) (E) (H) (AW) (U8)

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<b>Test:</b>	<b>ADZE</b>		
<b>Date:</b>	05/28/68	<b>Sponsor:</b>	LASL
<b>Time:</b>	0745 PDT	<b>Depth of Burial:</b>	787 ft
<b>Location:</b>	NTS U3fw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $7.0 \times 10^{-3}$

**Isotopes Identified in the Release:**  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{138}\text{Xe}$

---

**Release Summary:** All activity released was attributed to the cable pull.

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**References:** (B) (E) (H) (AW)

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**Detonation:** **TUB-D** (simultaneous with TUB-A, -B, -C, -F, separate holes)

<b>Date:</b>	06/06/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	1430 PDT	<b>Depth of Burial:</b>	896 ft
<b>Location:</b>	NTSU10ajD	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release at Time of Release, in Curies:**  $1.6 \times 10^3$

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

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**Release Summary:** A gas sampling release occurred from hole D on June 6, 1968, at approximately H+2 hours and lasted for two hours and five minutes.

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**References:** (C) (E) (H) (AW) (N6)

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**Test:** **FUNNEL**

<b>Date:</b>	06/25/68	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PDT	<b>Depth of Burial:</b>	387 ft
<b>Location:</b>	NTS U3ga	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $2.0 \times 10^{-5}$

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**Release Summary:** A test release occurred at H+3 minutes from surface ground zero.

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**References:** (B) (E) (H) (AW) (V8)

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**Test:** **SEVILLA**

<b>Date:</b>	06/25/68	<b>Sponsor:</b>	LASL
<b>Time:</b>	0830 PDT	<b>Depth of Burial:</b>	1,175 ft
<b>Location:</b>	NTS U3fk	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $4.0 \times 10^{-3}$

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**Isotopes Identified in the Release:**  $^{135}\text{Xe}$  and  $^{135}\text{I}$

**Release Summary:** The activity released was attributed to the cable pull.

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**References:** (B) (E) (H) (AW) (UJ)

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<b>Test:</b>	<b>TANYA</b>		
<b>Date:</b>	07/30/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	1,250 ft
<b>Location:</b>	NTS U2dt	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.4 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.3 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 4.2

$^{135}\text{Xe}$  in curies: 2.1

---

**Release Summary:** Drillback releases occurred from the ventilation line at 2150 hours on August 3, 1968, lasting for one hour, and at 2310 hours, lasting for ten minutes.

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**References:** (C) (E) (H) (AX) (N7)

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<b>Test:</b>	<b>IMP</b>		
<b>Date:</b>	08/09/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	597 ft
<b>Location:</b>	NTS U2bj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release Activity at R+12 Hours, in Curies:**  $4.2 \times 10^3$

**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{88}\text{Rb}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

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**Release Summary:** A test release occurred from the crater at 0803 hours on August 9, 1968, and lasted for 2.5 days.

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**References:** (C) (E) (H) (AX) (V9)

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<b>Test:</b>	<b>RACK</b>		
<b>Date:</b>	08/15/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	655 ft
<b>Location:</b>	NTS U9ap	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling and Drillback

**Gas Sampling Release Activity at Time of Release, in Curies:** 9.5

**Isotopes Identified in the Release:**\*  $^{88}\text{Kr}$  and  $^{135}\text{Xe}$

**Drillback Release Activity at Time of Release, in Curies:**  $2.8 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $1.0 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $5.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $1.7 \times 10^{-1}$

**Release Summary:** A release occurred from the gas sampling line at 1208 hours on August 15, 1968, and lasted for 25 minutes.

A drillback release occurred from the ventilation line at 0800 hours on August 17, 1968, and lasted for 30 minutes.

**References:** (C) (E) (H) (AX) (UD)

\*Quantitative isotopic data is not available.

<b>Test:</b>	<b>DIANA MOON</b>		
<b>Date:</b>	08/27/68	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	0930 PDT	<b>Depth of Burial:</b>	794 ft
<b>Location:</b>	NTS U11e	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours, in Curies:**  $1.2 \times 10^4$

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Xe}$

**Release Summary:** Uncontrolled Releases occurred as follows:

1. Seepage from the surface ground zero area occurred from H+3 to H+17 minutes. Effluent consisted primarily of  $^{138}\text{Xe}$  with small quantities of  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$ .

2. Seepage from the surface ground zero area occurred from H+5 to H+13 hours. Effluent consisted primarily of  $^{135}\text{Xe}$  with small quantities of radioiodine.

Total radioiodines released from the DIANA MOON test were estimated to be 3.6 curies of  $^{135}\text{I}$ , 2.1 curies of  $^{133}\text{I}$ , and 0.1 curies of  $^{131}\text{I}$  (at the time of release).

**References:** (B) (E) (H) (L) (P) (AX) (EX) (N8)

<b>Test:</b>	<b>NOGGIN</b>		
<b>Date:</b>	09/06/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,909 ft
<b>Location:</b>	NTS U9bx	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $5.2 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $9.6 \times 10^{-1}$

**Release Summary:** Drillback releases occurred from the ventilation line at 0940 hours on September 9, 1968, lasting for 140 minutes, and at 1415 hours on September 10, 1968, lasting for 60 minutes.

**References:** (C) (E) (H) (AX) (J1)

<b>Test:</b>	<b>STODDARD</b>		
<b>Date:</b>	09/17/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,535 ft
<b>Location:</b>	NTS U2cmS	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.6 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $4.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.3 \times 10^{-1}$

**Release Summary:** Drillback releases occurred from the ventilation line at 1330 hours on September 21, 1968, lasting for 40 minutes, and at 1500 hours on September 22, 1968, lasting for two hours.

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**References:** (C) (E) (H) (AX) (N9)

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<b>Test:</b>	<b>HULA</b>		
<b>Date:</b>	10/29/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0836 PST	<b>Depth of Burial:</b>	656 ft
<b>Location:</b>	NTS U9bu	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test, Gas Sampling, and Drillback

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**Test Release at R+12 Hours, in Curies:**  $6.0 \times 10^{-2}$

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**Gas Sampling Release Activity at Time of Release, in Curies:** 5.0

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**Isotopes Identified in the Release:**  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**Drillback Release Activity at Time of Release, in Curies:** 2.9

$^{133}\text{Xe}$  in curies: 2.0

$^{133\text{m}}\text{Xe}$  in curies:  $8.5 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $8.9 \times 10^{-1}$

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**Release Summary:** A test release occurred from the cables at 0920 hours on October 29, 1968, and lasted for one hour.

A planned release occurred from the gas sampling system at 1110 hours on October 29, 1968, and lasted for 35 minutes.

Two intermittent drillback releases occurred from the ventilation line starting at 2100 hours on October 31, 1968, for a total release time of two hours, and two intermittent drillback releases occurred from the ventilation line starting at 0200 hours on November 1, 1968, for a total release time of 1.5 hours.

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**References:** (C) (E) (H) (X) (AX) (VA)

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**Test: TINDERBOX**

<b>Date:</b>	11/22/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0819 PST	<b>Depth of Burial:</b>	1,450 ft
<b>Location:</b>	NTS U9az	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies: 2.0** $^{133}\text{Xe}$  in curies: 1.2 $^{133\text{m}}\text{Xe}$  in curies:  $5.4 \times 10^{-2}$  $^{135}\text{Xe}$  in curies:  $7.2 \times 10^{-1}$ 

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**Release Summary:** A drillback release occurred from the ventilation line at 2140 hours on November 24, 1968, and lasted for 50 minutes.

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**References:** (C) (E) (H) (AX) (L5)

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**Test: SCHOONER**

<b>Date:</b>	12/08/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	365 ft
<b>Location:</b>	NTS U20u	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Crater	<b>Yield:</b>	30 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test/Crater

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**Test Release at R+12 Hours, in Curies:  $3.7 \times 10^6$** 

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**Isotopes Identified in the Release:**  $^{54}\text{Mn}$ ,  $^{106}\text{Ru}$ ,  $^{131}\text{I}$ ,  $^{137}\text{Cs}$ ,  $^{181}\text{W}$ , and  $^{187}\text{W}$

**Cloud Direction:** Northeasterly across Utah and Colorado; the base surged north to Idaho, then east across Montana and North Dakota

**Maximum Activity Detected in Air Offsite:** 280,000 picocuries of  $^{187}\text{W}$  per cubic meter of air at Clark Station, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** 350 mR/h on Highway 25 (Nevada) near the Lincoln-Nye county line (unpopulated), and 8.5 mR/h at the Diablo Maintenance Station, Nevada (populated)

**Maximum Iodine Level Detected Offsite:** 28 picocuries of  $^{131}\text{I}$  per cubic meter of air and 680 picocuries of  $^{133}\text{I}$  per cubic meter of air at Clark Station, Nevada; highest concentration of  $^{135}\text{I}$  in air at Warm Springs, Nevada, 220 picocuries per cubic meter; highest concentration of

$^{131}\text{I}$  in milk, 100 picocuries per liter in a December 11, 1968, sample from the Boyd Schena Ranch near Abraham, Utah

**Maximum Distance Radiation Detected Offsite:** 0.2 mR/h at Delta, Utah

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**Release Summary:** The planned test release from the surface ground zero area occurred at H time and lasted for one minute.

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**References:** (C) (E) (H) (M) (AX) (DQ)

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**Detonations:** **TYG-A, -B, -C** (simultaneous with TYG-D, -E, and -F, separate holes)

<b>Date:</b>	12/12/68	<b>Sponsor:</b>	LRL
<b>Time:</b>	0710 PST	<b>Depth of Burial:</b>	U2dc4 (-A) 749 ft U2dc5 (-B) 824 ft U2dc3 (-C) 749 ft
<b>Location:</b>	NTS U2dc4 (-A) NTS U2dc5 (-B) NTS U2dc3 (-C)	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $6.8 \times 10^3$

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**Isotopes Identified in the Release:**  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$

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**Drillback Release Activity at Time of Release, in Curies:**  $4.8 \times 10^1$

$^{133}\text{Xe}$  in curies:  $4.6 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $7.8 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 1.2

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**Release Summary:** Test releases occurred from the U2dc4 (TYG A) surface ground zero area at H+4.75 hours, lasting for 19.25 hours and from the U2dc5 (TYG B) surface ground zero area at H+26.4 hours, lasting for 23.2 hours.

Drillback releases occurred from the ventilation line No. 3, U2dc3 (TYG C), at 1450 hours on December 15, 1968, lasting for 40 minutes; at 1530 hours on December 19, 1968, lasting for 30 minutes; and at 1440 hours on December 21, 1968, lasting for 20 minutes.

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**References:** (C) (E) (H) (X) (AX) (MH) (NA)

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**Test: SCISSORS**

<b>Date:</b>	12/12/68	<b>Sponsor:</b>	LASL
<b>Time:</b>	0720 PST	<b>Depth of Burial:</b>	789 ft
<b>Location:</b>	NTS U3gh	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $1.3 \times 10^{-4}$ 

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$ 

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**Release Summary:** A test release occurred from surface ground zero at H+6 minutes and lasted for 38 minutes.

---

**References:** (B) (E) (H) (AX)

---

**Test: PACKARD**

<b>Date:</b>	01/15/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	1130 PST	<b>Depth of Burial:</b>	810 ft
<b>Location:</b>	NTS U2u	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	10 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:** 7.2

---

**Release Summary:** A test release from the surface ground zero area occurred at H+10.4 minutes and lasted for 15 minutes.

---

**References:** (C) (E) (H) (AX) (NB)

---

**Test: VALISE**

<b>Date:</b>	03/18/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	296 ft
<b>Location:</b>	NTS U9by	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:** Less than  $1.0 \times 10^{-3}$

**Release Summary:** A release occurred during a gas sampling operation at zero time and lasted for one hour.

---

**References:** (C) (E) (H) (AX) (VB)

---

**Test:** **CHATTY**

<b>Date:</b>	03/18/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0640 PST	<b>Depth of Burial:</b>	639 ft
<b>Location:</b>	NTS U2bn	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $6.7 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $1.5 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $7.6 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $5.1 \times 10^{-1}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1925 hours on March 19, 1969, and lasted for 25 minutes.

---

**References:** (C) (E) (H) (AX) (U5)

---

**Test:** **BARSAC**

<b>Date:</b>	03/20/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	1012 PST	<b>Depth of Burial:</b>	997 ft
<b>Location:</b>	NTS U3gc	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $4.3 \times 10^1$

---

**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**Release Summary:** A test release from the surface ground zero area occurred at H+10 hours, 59 minutes and lasted for 29.8 hours.

---

**References:** (B) (E) (H) (AX) (TS)

---

**Test: COFFER**

<b>Date:</b>	03/21/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	1,525 ft
<b>Location:</b>	NTS U2de	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 100 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $9.9 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 2.4

$^{135}\text{Xe}$  in curies:  $8.0 \times 10^{-2}$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 1100 hours on March 27, 1969, lasting for 8.3 hours, and at 0600 hours on March 28, 1969, lasting for 5.5 hours.

---

**References:** (C) (E) (H) (AX) (NC)

---

**Test: BLENTON**

<b>Date:</b>	04/30/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,831 ft
<b>Location:</b>	NTS U7p	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $9.0 \times 10^{-5}$

---

**Isotopes Identified in the Release:**  $^{138}\text{Xe}$

---

**Release Summary:** A test release occurred from the surface ground zero area at H+10 minutes and lasted for 18.8 hours.

---

**References:** (B) (E) (H) (AX) (TT)

---

**Detonation:** **IPECAC-A** (simultaneous with IPECAC-B, separate holes)

<b>Date:</b>	05/27/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	407 ft
<b>Location:</b>	NTS U3hk-a	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours:** Trace

---

**Isotopes Identified in the Release:** xenons

---

**Release Summary:** A test release occurred from surface ground zero at H+12 minutes and lasted for 2.8 hours. All activity from this release was attributed to cable off-gassing from the catcher pull.

---

**References:** (B) (E) (H) (AX) (VC)

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**Test:** **TAPPER**

<b>Date:</b>	06/12/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	994 ft
<b>Location:</b>	NTS U3go	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $4.6 \times 10^{-6}$

---

**Isotopes Identified in the Release:**  $^{138}\text{Xe}$

---

**Release Summary:** A test release occurred from the surface ground zero area at H+16 minutes and lasted for 23 minutes.

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**References:** (B) (E) (H) (AX) (J2)

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**Test:** **HUTCH**

<b>Date:</b>	07/16/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0755 PDT	<b>Depth of Burial:</b>	1,800 ft
<b>Location:</b>	NTS U2df	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $1.1 \times 10^3$**  $^{133}\text{Xe}$  in curies:  $9.0 \times 10^2$  $^{133\text{m}}\text{Xe}$  in curies:  $2.9 \times 10^1$  $^{135}\text{Xe}$  in curies:  $1.5 \times 10^2$ 

---

**Release Summary:** Drillback releases occurred from the ventilation line as follows: (1) at 0430 hours on July 19, 1969, lasting for 8.5 hours; (2) at 0700 hours on July 22, 1969, lasting for 2.75 hours; (3) at 1540 hours on July 23, 1969, lasting for 5.83 hours; and (4) at 0705 hours on July 25, 1969, lasting for 20 minutes.

---

**References:** (C) (E) (H) (AA) (ND)

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**Detonations: SPIDER-A, -B (simultaneous, separate holes)**

<b>Date:</b>	08/14/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	699 ft, 745 ft
<b>Location:</b>	NTS U2bp-1, -2	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 1.7** $^{133}\text{Xe}$  in curies: 1.7 $^{133\text{m}}\text{Xe}$  in curies:  $3.5 \times 10^{-2}$ 

---

**Release Summary:** A drillback release occurred from the ventilation line at 1920 hours on August 21, 1969, and lasted for five minutes.

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**References:** (C) (E) (H) (AA) (NE)

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**Test: PLIERS**

<b>Date:</b>	08/27/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	0645 PDT	<b>Depth of Burial:</b>	784 ft
<b>Location:</b>	NTS U3gn	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:  $1.6 \times 10^{-2}$** 

**Isotopes Identified in the Release:**  $^{135}\text{I}$  and  $^{138}\text{Xe}$

---

**Release Summary:** A test release from the surface ground zero area occurred at H+8 minutes and lasted for 5.6 hours.

---

**References:** (B) (E) (H) (P) (AA) (J5)

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<b>Test:</b>	<b>RULISON</b>		
<b>Date:</b>	09/10/69	<b>Sponsor:</b>	LASL/DPNE
<b>Time:</b>	1500 MDT	<b>Depth of Burial:</b>	8,425 ft
<b>Location:</b>	Grand Valley, Colorado	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	40 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release:** Gas flaring

---

**Maximum Activity Detected in Air Offsite:** Tritium was detected above background levels during flaring operations.

**Maximum Gamma Exposure Rate Detected Offsite:** No gamma radiation was detected.

**Maximum Iodine Level Detected Offsite:** No iodine was detected offsite.

**Maximum Distance Radiation Detected Offsite:** No gamma radiation was detected.

---

**Release Summary:** Well gas was first flared on August 1, 1970. A successful high-rate flaring commenced at 1430 hours MST on October 26, 1970. Krypton-85 and tritium were identified in the controlled release.

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**References:** (C) (E) (H) (AA) (DR) (HR)

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<b>Test:</b>	<b>MINUTE STEAK</b>		
<b>Date:</b>	09/12/69	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	1103 PDT	<b>Depth of Burial:</b>	867 ft
<b>Location:</b>	NTS U11f	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $8.4 \times 10^3$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

---

**Release Summary:** A test release, in the form of seepage from the surface ground zero area, occurred at H+5 minutes and continued until H+4 hours. The effluent consisted primarily of  $^{138}\text{Xe}$  and  $^{135}\text{Xe}$ , with lesser quantities of  $^{133}\text{Xe}$ . Radioiodine released (at the time of release) included 34 curies of  $^{135}\text{I}$ , 3.4 curies of  $^{133}\text{I}$ , and 0.05 curies of  $^{131}\text{I}$ .

---

**References:** (C) (E) (H) (L) (N) (P) (AA) (E1) (NF)

---

**Detonation:** **KYACK-B** (simultaneous with KYACK-A, separate holes)

<b>Date:</b>	09/20/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	630 ft
<b>Location:</b>	NTS U2bq-2	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $5.1 \times 10^2$

---

**Isotopes Identified in the Release:**  $^{135}\text{Xe}$

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**Release Summary:** A test release occurred from the U2bq-2 crater at H+9.5 hours and lasted for 16 hours.

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**References:** (C) (E) (H) (AA) (VD)

---

**Detonation:** **SEAWEED-D**  
(simultaneous with SEAWEED-C and -E, separate holes)

<b>Date:</b>	10/01/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	387 ft
<b>Location:</b>	NTS U3hk-f	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $5.0 \times 10^{-8}$

---

**Isotopes Identified in the Release:**  $^{138}\text{Xe}$

---

**Release Summary:** A test release occurred from surface ground zero at H+16 minutes and lasted for 10 minutes.

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**References:** (B) (E) (H) (AA) (UG)

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<b>Test:</b>	<b>PIPKIN</b>		
<b>Date:</b>	10/08/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	2,050 ft
<b>Location:</b>	NTS U20b	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	200 to 1000 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 6.3**

$^{133}\text{Xe}$  in curies: 6.3

$^{133\text{m}}\text{Xe}$  in curies:  $6.2 \times 10^{-3}$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 1935 hours on November 2, 1969, lasting for 15 minutes, and at 2115 hours on November 2, 1969, lasting for 10 minutes.

---

**References:** (C) (E) (H) (AA) (NG)

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<b>Test:</b>	<b>SEAWEED B</b>		
<b>Date:</b>	10/16/69	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	387 ft
<b>Location:</b>	NTS U3hk	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

**Test Release at R+12 Hours, in Curies:  $2.0 \times 10^{-7}$**

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**Isotopes Identified in the Release:**  $^{138}\text{Xe}$

---

**References:** (B) (E) (H) (AA) (UH)

---

<b>Detonations:</b>	<b>POD-A, -D</b> (simultaneous with POD-B and -C, separate holes)		
<b>Date:</b>	10/29/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	1200 PST	<b>Depth of Burial:</b>	876 ft, 1,024 ft
<b>Location:</b>	NTS U2ck, U2cj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	16.7 kt (total test)
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:  $3.9 \times 10^3$**

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Cs}$

**Cloud Direction:** Southerly; tracked by aircraft for 35 miles before the cloud became undetectable

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** 0.04 mR/h at Lathrop Wells, Nevada

**Maximum Iodine Level Detected Offsite:** No iodines were detected.

**Maximum Distance Radiation Detected Offsite:** At four miles north of Pahrump, Nevada, (detected by aerial monitoring)

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.1 \times 10^1$

$^{133}\text{Xe}$  in curies:  $3.0 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $4.9 \times 10^{-1}$

---

**Release Summary:** A test release from the U2ck surface ground zero area occurred at H+1 minute and lasted for 9 hours.

Drillback releases occurred from the U2cj ventilation line at 0010 hours on November 7, 1969, lasting for 20 minutes, and from the U2ck ventilation line at 1000 hours on November 7, 1969, lasting for one hour.

---

**References:** (C) (D) (E) (H) (Q) (X) (Z) (AA) (EQ) (HS) (NH)

---

**Test:** **SCUTTLE**

**Date:** 11/13/69

**Sponsor:** LRL

**Time:** 0715 PST

**Depth of Burial:** 540 ft

**Location:** NTS U2bh

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** 1.7 kt

**Release**

**Detected:** Offsite

**Type of**

**Release:** Test

---

**Test Release at R+12 Hours, in Curies:**  $2.1 \times 10^2$

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**Isotopes Identified in the Release:**  $^{88}\text{Rb}$ ,  $^{133}\text{I}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Cs}$

**Maximum Activity Detected in Air Offsite:** No fresh fission products were detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were noted.

**Maximum Iodine Level Detected Offsite:** No iodine was detected.

**Maximum Distance Radiation Detected Offsite:** At five miles southeast of Lathrop Wells, Nevada, (detected by aerial monitoring)

---

**Release Summary:** A test release occurred at H+5 minutes from the surface ground zero emplacement casing and lasted for three hours.

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**References:** (C) (E) (H) (Z) (AA) (ER) (ES) (NI)

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<b>Detonations:</b>	<b>TUN-B, -C, -D</b> (simultaneous with TUN-A, separate holes)		
<b>Date:</b>	12/10/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	637 ft, 637 ft, 840 ft
<b>Location:</b>	NTS U10am-2, -3, -4	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Gas Sampling

---

**Test Release at R+12 Hours, in Curies:**  $7.2 \times 10^1$

---

**Gas Sampling Release Activity at R+12 Hours\* in Curies:**  $1.6 \times 10^2$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^2$

$^{88}\text{Kr}$  in curies: 6.0

xenons in curies:  $4.8 \times 10^1$

---

**Release Summary:** A test release occurred from the U10am-2 surface ground zero area at H+1 minute and lasted for 32 minutes. A second release occurred from the U10am-3 surface ground zero area at H+1 minute and lasted for 92 minutes.

A gas sampling release occurred from the U10am-3 gas sampling line at 0747 hours on December 10, 1969, and lasted for 35 hours. After postshot drilling began, an additional 48 curies of xenons were released as a result of gas sampling operations. Specifically, 5.8 curies were released from the U10am-3 gas sampling line, and 42 curies were released from the U10am-4 gas sampling line. The releases began at 0210 hours on December 11, 1969, and lasted for two days.

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**References:** (C) (E) (H) (AA) (QD)

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\*Gas sampling release activity at the time of release is not available.

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**Detonations:** **TERRINE-WHITE, -YELLOW** (simultaneous, separate holes)

<b>Date:</b>	12/18/69	<b>Sponsor:</b>	LRL
<b>Time:</b>	1100 PST	<b>Depth of Burial:</b>	1,499 ft, 1,368 ft
<b>Location:</b>	NTS U9bi-1, -2	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $4.8 \times 10^1$

$^{133}\text{Xe}$  in curies:  $4.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.5

$^{135}\text{Xe}$  in curies: 1.2

---

**Release Summary:** Drillback releases occurred from the ventilation line at 1930 hours on December 22, 1969, lasting for two hours, and at 0355 hours on December 23, 1969, lasting for five minutes.

---

**References:** (C) (E) (H) (AA) (NJ)

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**Detonations:** **YANNIGAN-RED, -BLUE, -WHITE**  
(simultaneous, separate holes)

<b>Date:</b>	02/26/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	1,286 ft, 1, 293 ft, 1,191 ft
<b>Location:</b>	NTS U2ay-1, -2, -3	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $3.2 \times 10^2$

$^{133}\text{Xe}$  in curies:  $3.1 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 6.9

$^{135}\text{Xe}$  in curies: 4.4

---

**Release Summary:** Five intermittent drillback releases occurred from the U2ay-2 ventilation line starting at 0420 hours on February 28, 1970, for a total release time of 2.83 hours. Four intermittent releases occurred from the U2ay-3 ventilation line starting at 1500 hours on March 2, 1970, for a total release time of 2.75 hours, and nine intermittent releases occurred from the U2ay-1 ventilation line starting at 1245 hours on March 5, 1970, for a total release time of 6.92 hours.

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**References:** (C) (E) (H) (X) (AA) (UV)

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**Test: CYATHUS**

<b>Date:</b>	03/06/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0624 PST	<b>Depth of Burial:</b>	950 ft
<b>Location:</b>	NTS U8b	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	8.7 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at R+12 Hours,\* in Curies:** Less than  $4.6 \times 10^1$

$^{133}\text{Xe}$  in curies:  $4.5 \times 10^1$

$^{135}\text{Xe}$ : trace

$^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ , and  $^{132}\text{Te}$  in curies: less than 1.0

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**Release Summary:** A drillback release occurred from the drilling rig cellar at 0913 hours on March 13, 1970, and lasted for 27 minutes.

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**References:** (C) (E) (H) (AA) (NK)

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\*Drillback release activity at the time of release is not available.

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**Test: SNUBBER**

<b>Date:</b>	04/21/70	<b>Sponsor:</b>	LASL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	1,129 ft
<b>Location:</b>	NTS U3ev	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	12.7 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $5.5 \times 10^4$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{138}\text{Xe}$

**Cloud Direction:** Northeasterly; tracked by aircraft to 90 miles from surface ground zero

**Maximum Activity Detected in Air Offsite:** 6.0 picocuries of gross beta activity per cubic meter of air at Coyote Summit, Nevada (unpopulated)

**Maximum Gamma Exposure Rate Detected Offsite:** 0.6 mR/h at Coyote Summit, Nevada

**Maximum Iodine Level Detected Offsite:** 87 picocuries of  $^{133}\text{I}$  per cubic meter of air and 300 picocuries of  $^{135}\text{I}$  per cubic meter of air at Coyote Summit, Nevada; maximum concentration at Koyné's Mill, Nevada (populated area), 36 picocuries of  $^{133}\text{I}$  per cubic meter of air and 86 picocuries of  $^{135}\text{I}$  per cubic meter of air

**Maximum Distance Radiation Detected Offsite:** Koyne's Mill, Nevada (on the ground); the effluent was tracked by aircraft to North Central Arizona, approximately 200 miles from the surface ground zero area.

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**Release Summary:** Test releases occurred from the cables in the trailer area at H+4 minutes, lasting for approximately 11 minutes; from the surface ground zero area at H+15 minutes, lasting for 55 minutes; and from seepage at the surface ground zero area at H+70 minutes, lasting for approximately 23.5 hours.

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**References:** (B) (D) (E) (H) (Z) (AA) (D0) (HT) (ST)

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**Detonations:** **HOD-A (GREEN), -B (RED)** (simultaneous, separate holes)

<b>Date:</b>	05/01/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0740 PDT	<b>Depth of Burial:</b>	870 ft, 790 ft
<b>Location:</b>	NTS U9ITS X-20, X-23	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:** 1.0

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**Drillback Release Activity at Time of Release, in Curies:**  $2.7 \times 10^2$

$^{133}\text{Xe}$  in curies:  $1.5 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies:  $7.7 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $5.9 \times 10^1$

$^{88}\text{Kr}$  in curies:  $5.9 \times 10^1$

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**Release Summary:** A test release from the U9ITS X-20 surface ground zero area occurred at H+1 minute and lasted for 13 minutes.

Drillback releases occurred from the U9ITS X-20 gas sampling line at 0745 hours on May 1, 1970, lasting for 16.3 hours; from the U9ITS X-23 gas sampling line at 0746 hours on May 1, 1970, lasting for 1.4 hours; and from the U9ITS X-23 ventilation line at 2150 hours on May 16, 1970, lasting for 6.2 hours.

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**References:** (C) (E) (H) (AA) (NL)

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**Test: MINT LEAF**

<b>Date:</b>	05/05/70	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	0830 PDT	<b>Depth of Burial:</b>	1,300 ft
<b>Location:</b>	NTS U12t.01	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at Time of Release, in Curies:**  $9.6 \times 10^5$ **Controlled Release Activity at R+12 Hours, in Curies:**  $3.9 \times 10^5$ **Isotopes Identified in the Release:**  $^{85m}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{133}\text{Xe}$ ,  $^{133m}\text{Xe}$ , and  $^{135}\text{Xe}$ **Cloud Direction:** Easterly**Maximum Activity Detected in Air Offsite:** 6,000 picocuries of  $^{135}\text{Xe}$  per cubic meter of air on Highway 25 Nevada (populated), no gross beta detected**Maximum Gamma Exposure Rate Detected Offsite:** 0.02 mR/h near Queen City Summit, Nevada (unpopulated)**Maximum Iodine Level Detected Offsite:** No special water, milk, or other samples were collected for this test.**Maximum Distance Radiation Detected Offsite:** 0.02 mR/h at Queen City Summit, Nevada

**Release Summary:** Three controlled releases occurred as follows: (1) during gas sampling between H+4.6 and H+7.5 hours when predominantly fission gases ( $^{135}\text{Xe}$  and  $^{85m}\text{Kr}$ ) were exhausted into the ventilation lines and passed through the filter system before being released to the atmosphere; (2) during ventilation of the tunnel complex with the effluent (approximately 98%  $^{135}\text{Xe}$ , 2%  $^{133}\text{Xe}$ , and less than 1 curie of radioiodines) passing through the filter system between H+24 and H+31 hours; and (3) during ventilation of the tunnel complex at H+166.2 hours until the tunnel was cleared with the effluent ( $^{133}\text{Xe}$  and  $^{133m}\text{Xe}$ ) released passing through a filter system.

**References:** (C) (D) (E) (H) (L) (AA) (ET) (FE) (HU) (HV)**Test: DIAMOND DUST**

<b>Date:</b>	05/12/70	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	728 ft
<b>Location:</b>	NTS U16a.05	<b>Purpose:</b>	Vela Uniform
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at Time of Release, in Curies: 5.0**

**Controlled Release Activity at R+12 Hours, in Curies: 4.0**

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**Isotopes Identified in the Release:**  $^{133}\text{Xe}$  and  $^{133\text{m}}\text{Xe}$

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**Release Summary:** A controlled release, with the permission of the Test Manager, occurred at H+73.4 hours and continued until the tunnel was cleared.

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**References:** (E) (H) (L) (AA) (DW) (TZ)

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**Test: MANZANAS**

<b>Date:</b>	05/21/70	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	791 ft
<b>Location:</b>	NTS U3gr	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $7.0 \times 10^{-2} - 1.5 \times 10^{-1}$

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**Release Summary:** A test release occurred at H+6 minutes from the surface ground zero area and lasted for five minutes.

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**References:** (B) (E) (H) (AA) (J8)

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**Test: HUDSON MOON**

<b>Date:</b>	05/26/70	<b>Sponsor:</b>	DoD/LRL
<b>Time:</b>	0716 PDT	<b>Depth of Burial:</b>	1,385 ft
<b>Location:</b>	NTS U12e.12	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled and Uncontrolled

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**Controlled Release Activity at Time of Release, in Curies:**  $5.0 \times 10^2$

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**Controlled Release Activity at R+12 Hours, in Curies:**  $3.3 \times 10^2$

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**Isotopes Identified in the Release:**  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$

---

**Uncontrolled Release at R+12 Hours, in Curies:**  $7.9 \times 10^2$

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**Isotopes Identified in the Release:**  $^{85\text{m}}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ , and  $^{135}\text{Xe}$

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**Release Summary:** Two test releases occurred as follows: (1) an uncontrolled release (primarily  $^{135}\text{Xe}$ , with lesser quantities of  $^{88}\text{Kr}$  and  $^{85\text{m}}\text{Kr}$ ) between H+2.3 and H+25.3 hours through the tunnel ventilation system, apparently due to natural draft, but was passed through the

filter system before its release to the atmosphere, and (2) a controlled release of the tunnel area to the gas seal door between H+25.3 and H+26.4 hours to ensure that effluent (primarily  $^{135}\text{Xe}$ ) was filtered before release to the atmosphere.

Ventilation of the total tunnel complex was started on July 7, 1970, but the activity released ( $^{133}\text{Xe}$ ) was below the detection limit (25 mCi/min) of the RAM system. This activity did not contribute to the total amount of effluent released from the HUDSON MOON test.

**References:** (C) (E) (H) (L) (AA) (NN)

<b>Detonations:</b>	<b>FLASK-GREEN, -YELLOW, -RED</b> (simultaneous, separate holes)		
<b>Date:</b>	05/26/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	1,736 ft, 1,099 ft, 499 ft
<b>Location:</b>	NTS U2az-1, -2, -3	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	105 kt (-Green) Less than 20 kt each (-Yellow & -Red)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

**Test Release at R+12 Hours, in Curies:**  $4.9 \times 10^1$

**Drillback Release Activity at Time of Release, in Curies:**  $1.4 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.4 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $2.5 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-2}$

**Release Summary:** Test releases occurred from the U2az-3 gas sampling line at H hour, lasting for 71 minutes, and from the U2az-3 surface ground zero area, as the result of a cable pull, at H+6.5 hours on May 26, 1970, lasting for approximately 3.3 hours.

Drillback releases occurred from the U2az-2 ventilation line at 2140 hours on May 31, 1970, lasting for 25 minutes, and from the U2az-1 ventilation line at 1640 hours on June 4, 1970, lasting for 50 minutes.

**References:** (C) (E) (H) (X) (AA) (NM)

<b>Test:</b>	<b>PITON-C</b>		
<b>Date:</b>	05/28/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0445 PDT	<b>Depth of Burial:</b>	330 ft
<b>Location:</b>	NTS U9ITS AA-25	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $2.5 \times 10^4$

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**Release Summary:** A test release occurred from the surface ground zero area at H+30 seconds, lasting for 2.4 hours.

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**References:** (C) (E) (H) (AA) (VE)

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<b>Detonation:</b>	<b>PITON-A</b> (simultaneous with PITON-B, separate holes)		
<b>Date:</b>	05/28/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0500 PDT	<b>Depth of Burial:</b>	774 ft
<b>Location:</b>	NTS U9ITS Y-30	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:** Greater than  $1.0 \times 10^1$

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**Release Summary:** A test release of greater than 10 curies occurred, but this was masked by the PITON-C release.

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**References:** (C) (E) (H) (AA) (VE)

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<b>Detonation:</b>	<b>ARNICA-VIOLET</b> (simultaneous with ARNICA-YELLOW, separate holes)		
<b>Date:</b>	06/26/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	866 ft
<b>Location:</b>	NTS U2dd-3	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $7.3 \times 10^1$

$^{133}\text{Xe}$  in curies:  $7.1 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.8

$^{135}\text{Xe}$  in curies:  $7.6 \times 10^{-2}$

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**Release Summary:** Drillback releases occurred from the U2dd-3 ventilation line at 1045 hours on July 2, 1970, lasting for 30 minutes, and at 1310 hours on July 2, 1970, lasting for 30 minutes.

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**References:** (C) (E) (H) (AA) (NO)

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**Detonations:** **SCREE-ACAJOU, -ALHAMBRA**  
(simultaneous with SCREE-CHAMOIS, separate holes)

<b>Date:</b>	10/13/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0805 PDT	<b>Depth of Burial:</b>	815 ft, 630 ft
<b>Location:</b>	NTS U9ITS X-24, Z-21	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Drillback

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**Test Release at R+12 Hours, in Curies:**  $1.1 \times 10^1$

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**Drillback Release Activity at Time of Release, in Curies:**  $2.4 \times 10^2$

$^{133}\text{Xe}$  in curies:  $2.0 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 6.5

$^{135}\text{Xe}$  in curies:  $3.7 \times 10^1$

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**Release Summary:** A test release occurred from the U9ITS X-24 surface ground zero area at about H+1.5 minutes and lasted for 19 minutes.

Six intermittent drillback releases occurred from the U9ITS X-24 ventilation line starting at 1448 hours on October 15, 1970, for a total release time of 8.92 hours, and ten intermittent releases occurred from the U9ITS Z-21 ventilation line starting at 0940 hours on October 18, 1970, for a total release time of 10.75 hours.

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**References:** (C) (E) (H) (X) (AB) (QE)

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**Detonation:** **TRUCHAS-CHAMISAL**  
(simultaneous with TRUCHAS-CHACON and -RODARTE, separate holes)

<b>Date:</b>	10/28/70	<b>Sponsor:</b>	LASL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	387 ft
<b>Location:</b>	NTS U3ho	<b>Purpose:</b>	Safety Experiment
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:** 3.0

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**Isotopes Identified in the Release:**  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{140}\text{Ba}/^{140}\text{La}$

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**Release Summary:** A test release occurred at zero time from cables and lasted for less than one minute.

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**References:** (B) (E) (H) (AB)

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**Detonation:** **AVENS-CREAM**  
(simultaneous with AVENS-ANDORRE, -ALKERMES, and -ASAMLTE, separate holes)

<b>Date:</b>	12/16/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	965 ft
<b>Location:</b>	NTS U9ITS X-29	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

---

**Test Release at R+12 Hours, in Curies:**  $6.6 \times 10^1$

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**Isotopes Identified in the Release:**  $^{135}\text{Xe}$ ,  $^{138}\text{Xe}$ , and  $^{138}\text{Cs}$

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**Release Summary:** A test release from the cables occurred at H+5 minutes and lasted for 39 minutes.

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**References:** (C) (E) (H) (AB) (U0)

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**Test: CARPETBAG**

<b>Date:</b>	12/17/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0805 PST	<b>Depth of Burial:</b>	2,170 ft
<b>Location:</b>	NTS U2dg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	220 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies: 4.9** $^{133}\text{Xe}$  in curies: 4.8 $^{133\text{m}}\text{Xe}$  in curies:  $1.2 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $4.7 \times 10^{-3}$ 

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**Release Summary:** A drillback release occurred from the ventilation line at 0615 hours on December 23, 1970, and lasted for 15 minutes.

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**References:** (C) (E) (H) (AB) (NP)

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**Test: BANE BERRY**

<b>Date:</b>	12/18/70	<b>Sponsor:</b>	LRL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	912 ft
<b>Location:</b>	NTS U8d	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	10 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test

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**Test Release at R+12 Hours, in Curies:**  $6.7 \times 10^6$

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**Isotopes Identified in the Release:** Gross fission products

**Cloud Direction:** Northeasterly, parts of the cloud moved over Nevada, Utah, and Wyoming; another fraction moved towards California

**Maximum Activity Detected in Air Offsite:** 230 picocuries of  $^{131}\text{I}$  per cubic meter and 3,400 picocuries of  $^{133}\text{I}$  per cubic meter of air at Stone Cabin Ranch, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** Less than 1 mR/h in populated areas; 0.6 mR/h at Stone Cabin Ranch, Nevada

**Maximum Iodine Level Detected Offsite:** 810 picocuries of  $^{131}\text{I}$  per liter in milk at the McCurdy Ranch near Beatty, Nevada

**Maximum Distance Radiation Detected Offsite:** 0.05 mR/h at Austin, Nevada

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**Release Summary:** Venting occurred from a fissure near surface ground zero at H+3.5 minutes. The effluent venting rate steadily decreased with time, but visible vapor continued to emanate from the fissure for 24 hours after the detonation.

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**References:** (C) (D) (E) (H) (M) (Z) (AB) (DS) (NQ)

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<b>Test:</b>	<b>HAREBELL</b>		
<b>Date:</b>	06/24/71	<b>Sponsor:</b>	LRL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,702 ft
<b>Location:</b>	NTS U2br	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $8.4 \times 10^2$

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**Release Summary:** A drillback release from cracks south-southeast of the drilling pad began at approximately 2330 hours on June 27, 1971, and lasted for two days.

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**References:** (C) (E) (H) (AB) (NR)

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<b>Test:</b>	<b>CAMPHOR</b>		
<b>Date:</b>	06/29/71	<b>Sponsor:</b>	DoD/SL/LRL
<b>Time:</b>	1130 PDT	<b>Depth of Burial:</b>	1,390 ft
<b>Location:</b>	NTS U12g.10	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Controlled

---

**Test Release at R+12 Hours, in Curies:**  $2.2 \times 10^2$

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**Isotopes Identified in the Release:**  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$

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**Controlled Release Activity at Time of Release in Curies:**  $1.5 \times 10^2$

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**Controlled Release Activity at R+12 Hours, in Curies:**  $1.4 \times 10^2$

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**Isotopes Identified in the Release:**  $^{131}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$

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**Release Summary:** Test releases occurred from the cable building (on the mesa) at H+1 hour, lasting for 30 minutes and from the portal at H+3.9 hours, lasting for four days.

A controlled release, through the ventilation system of the tunnel complex, began at 1034 hours on July 27, 1971, and lasted for three days.

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**References:** (C) (E) (H) (K) (AB) (NS)

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**Test: MINIATA**

<b>Date:</b>	07/08/71	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,735 ft
<b>Location:</b>	NTS U2bu	<b>Purpose:</b>	Plowshare
<b>Type:</b>	Shaft	<b>Yield:</b>	83 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.8 \times 10^2$**  $^{133}\text{Xe}$  in curies:  $1.8 \times 10^2$  $^{133\text{m}}\text{Xe}$  in curies: 2.9 $^{135}\text{Xe}$  in curies:  $2.2 \times 10^{-3}$  $^{131}\text{I}$ : trace

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**Release Summary:** A drillback release occurred from the ventilation line at 2100 hours on July 16, 1971, and lasted for approximately 12.3 hours.

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**References:** (C) (E) (H) (AC) (NT)

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**Test: BRACKEN**

<b>Date:</b>	07/09/71	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,000 ft
<b>Location:</b>	NTS U10aq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $9.6 \times 10^{-1}$**  $^{133}\text{Xe}$  in curies:  $4.2 \times 10^{-1}$  $^{133\text{m}}\text{Xe}$  in curies:  $2.0 \times 10^{-2}$  $^{135}\text{Xe}$  in curies:  $5.2 \times 10^{-1}$ 

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**Release Summary:** Several intermittent drillback releases occurred from the ventilation line beginning at 0810 hours on July 11, 1971, and lasting for six hours.

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**References:** (B) (E) (H) (AC) (U2)

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**Test: DIAGONAL LINE**

<b>Date:</b>	11/24/71	<b>Sponsor:</b>	DoD/LLL
<b>Time:</b>	1215 PST	<b>Depth of Burial:</b>	867 ft
<b>Location:</b>	NTS U11g	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Test and Seepage

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**Test Release and Seepage at R+12 Hours, in Curies:**  $6.8 \times 10^3$

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**Isotopes Identified in the Release:**  $^{85m}\text{Kr}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ ,  $^{135}\text{I}$ ,  $^{131m}\text{Xe}$ ,  $^{133}\text{Xe}$ ,  $^{133m}\text{Xe}$ , and  $^{135}\text{Xe}$

**Cloud Direction:** Southwesterly towards Amargosa Desert area, Nevada

**Maximum Activity Detected in Air Offsite:** Fresh fission products were not detected.

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities were detected above background levels.

**Maximum Iodine Level Detected Offsite:** No iodines were detected in any samples.

**Maximum Distance Radiation Detected Offsite:** At six miles southeast of Lathrop Wells, Nevada, (detected by aerial monitoring)

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**Release Summary:** A test release (seepage) occurred from H+3.3 to H+20 hours. Low-level seepage continued for approximately three days, but all significant activity had been released by H+20 hours. Effluent was primarily  $^{135}\text{Xe}$  (80-85%),  $^{85m}\text{Kr}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{131m}\text{Xe}$ ,  $^{133}\text{Xe}$ , and  $^{133m}\text{Xe}$ , with trace quantities of  $^{131}\text{I}$ ,  $^{132}\text{I}$ ,  $^{133}\text{I}$ , and  $^{135}\text{I}$  detected. Minor levels of radioactivity were detected offsite by aircraft only.

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**References:** (C) (E) (H) (L) (Z) (AC) (EU) (HW) (HX) (NU)

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**Test: DIANTHUS**

<b>Date:</b>	02/17/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	1102 PST	<b>Depth of Burial:</b>	1,000 ft
<b>Location:</b>	NTS U10at	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.8 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.8 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $3.6 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-3}$

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**Release Summary:** Releases occurred during gas sampling operations through the ventilation line beginning at 2110 hours on February 24, 1972, and lasting for 27 hours.

---

**References:** (C) (E) (H) (AC) (U9)

---

**Test:** **SAPPHO**

<b>Date:</b>	03/23/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	1050 PST	<b>Depth of Burial:</b>	646 ft
<b>Location:</b>	NTS U2dh-2	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 8.6

$^{133}\text{Xe}$  in curies: 8.6

$^{133\text{m}}\text{Xe}$  in curies:  $3.9 \times 10^{-2}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 0140 hours on April 9, 1972, and lasted for 50 minutes.

---

**References:** (C) (E) (H) (AC) (UF)

---

**Test:** **KARA**

<b>Date:</b>	05/11/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	850 ft
<b>Location:</b>	NTS U2dh-3	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 6.8

$^{133}\text{Xe}$  in curies: 6.7

$^{133\text{m}}\text{Xe}$  in curies:  $7.3 \times 10^{-2}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1520 hours on May 22, 1972, and lasted for 20 minutes.

---

**References:** (C) (E) (H) (AC) (VF)

---

<b>Test:</b>	<b>ZINNIA</b>		
<b>Date:</b>	05/17/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	0710 PDT	<b>Depth of Burial:</b>	1,059 ft
<b>Location:</b>	NTS U2dk	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 6.7

$^{133}\text{Xe}$  in curies: 6.7

$^{133\text{m}}\text{Xe}$  in curies:  $8.3 \times 10^{-2}$

---

**Release Summary:** Drillback releases occurred from the ventilation line at 0010 hours on May 26, 1972, lasting for 10 minutes, and from the gas sampling line at 0240 hours on May 28, 1972, lasting for approximately 4.2 hours.

---

**References:** (C) (E) (H) (AC) (NV)

---

<b>Test:</b>	<b>MERIDA</b>		
<b>Date:</b>	06/07/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	0820 PDT	<b>Depth of Burial:</b>	670 ft
<b>Location:</b>	NTS U2dn	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.0 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $2.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $6.5 \times 10^{-3}$

---

**Release Summary:** Intermittent drillback releases occurred from the ventilation line beginning at 2225 hours on June 13, 1972, and lasting for 20 minutes.

---

**References:** (C) (E) (H) (AC) (VG)

---

**Test: ATARQUE**

<b>Date:</b>	07/25/72	<b>Sponsor:</b>	LASL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	964 ft
<b>Location:</b>	NTS U3ht	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^{-2}$

$^{133}\text{Xe}$ in curies:	$1.2 \times 10^{-2}$
$^{135}\text{Xe}$ in curies:	$8.5 \times 10^{-7}$
$^{131}\text{I}$ in curies:	$1.7 \times 10^{-6}$
$^{133}\text{I}$ in curies:	$1.4 \times 10^{-6}$

---

**Release Summary:** A release occurred during cementback operations between July 31 and August 2, 1972.

---

**References:** (B) (E) (H) (AD) (ST)

---

**Detonation: CEBOLLA**  
(simultaneous with CUCHILLO and SOLANO, separate holes)

<b>Date:</b>	08/09/72	<b>Sponsor:</b>	LASL
<b>Time:</b>	0631 PDT	<b>Depth of Burial:</b>	941 ft
<b>Location:</b>	NTS U3jc	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.7 \times 10^{-3}$

$^{133}\text{Xe}$ in curies:	$1.7 \times 10^{-3}$
$^{135}\text{Xe}$ in curies:	$1.0 \times 10^{-7}$
$^{131}\text{I}$ in curies:	$2.4 \times 10^{-7}$
$^{133}\text{I}$ in curies:	$2.4 \times 10^{-8}$

---

**Release Summary:** A drillback release occurred between August 22 and August 24, 1972.

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**References:** (B) (E) (H) (AD) (ST)

---

**Test: ARSENATE**

<b>Date:</b>	11/09/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	1015 PST	<b>Depth of Burial:</b>	821 ft
<b>Location:</b>	NTS U9ci	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Activity at Time of Release, in Curies:  $1.2 \times 10^1$**

$^{133}\text{Xe}$  in curies:  $1.2 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $2.5 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $3.6 \times 10^{-3}$

---

**Release Summary:** A release occurred from the ventilation line at 1400 hours on November 16, 1972, during a gas sampling operation and lasted for 20 minutes.

---

**References:** (C) (E) (H) (AD) (QF)

---

**Test: SOLANUM**

<b>Date:</b>	12/14/72	<b>Sponsor:</b>	LLL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	660 ft
<b>Location:</b>	NTS U9IW24.5	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $3.4 \times 10^{-2}$**

$^{133}\text{Xe}$  in curies:  $5.2 \times 10^{-3}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.7 \times 10^{-4}$

$^{135}\text{Xe}$  in curies:  $2.9 \times 10^{-2}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1315 hours on December 16, 1972, and lasted for 20 minutes.

---

**References:** (C) (E) (H) (X) (AD) (UM)

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<b>Test:</b>	<b>MIERA</b>		
<b>Date:</b>	03/08/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	0810 PST	<b>Depth of Burial:</b>	1,867 ft
<b>Location:</b>	NTS U7ad	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

**Cementback Release Activity at Time of Release, in Curies:**  $3.1 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $3.1 \times 10^{-3}$

**Release Summary:** A release of a small amount of xenon occurred during the cementback operation.

**References:** (B) (E) (H) (AD) (ST) (SZ)

<b>Test:</b>	<b>GAZOOK</b>		
<b>Date:</b>	03/23/73	<b>Sponsor:</b>	LLL
<b>Time:</b>	1215 PST	<b>Depth of Burial:</b>	1,070 ft
<b>Location:</b>	NTS U2do	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^1$

$^{133}\text{Xe}$  in curies: 9.3

$^{133\text{m}}\text{Xe}$  in curies:  $3.9 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 2.8

**Release Summary:** Two intermittent drillback releases occurred from the ventilation line on March 26, 1972, beginning at 0911 hours and lasting for 15 minutes.

**References:** (C) (E) (H) (AD) (VH)

<b>Detonation:</b>	<b>ANGUS*</b> (simultaneous with VELARDE)		
<b>Date:</b>	04/25/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	1425 PST	<b>Depth of Burial:</b>	1,486 ft
<b>Location:</b>	NTS U3jg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $6.1 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $6.1 \times 10^{-1}$

iodines in curies:  $1.3 \times 10^{-3}$

**References:** (B) (E) (H) (AD) (NW) (ST) (SZ)

<b>Detonation:</b>	<b>VELARDE*</b> (simultaneous with ANGUS)		
<b>Date:</b>	04/25/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	1425 PST	<b>Depth of Burial:</b>	908 ft
<b>Location:</b>	NTS U3jk	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Cementback

**Drillback and Cementback Release Activity at Time of Release, in Curies:**  $2.5 \times 10^2$

$^{133}\text{Xe}$  in curies:  $2.4 \times 10^2$

$^{135}\text{Xe}$  in curies:  $1.2 \times 10^1$

$^{131}\text{I}$  in curies:  $2.7 \times 10^{-2}$

$^{132}\text{I}$  in curies:  $5.2 \times 10^{-2}$

$^{133}\text{I}$  in curies:  $1.4 \times 10^{-1}$

$^{135}\text{I}$  in curies:  $1.6 \times 10^{-2}$

**Release Summary:** Chronic radioactive effluent releases occurred during coring and cementback operations. On April 27, 1973, above-background radiation levels were noted in the drilling rig cellar from gas trapped in the drilling pipe. Whenever the drilling pipe was open (i.e., when sections of pipe were being removed or when the stripper head was off) radioactive gas was released. By swing shift on April 27, 1973, respiratory protection was required during periods of potential release. The releases ceased after cementback of the hole on April 28, 1973.

**References:** (B) (E) (H) (AD) (QG) (QH) (QI) (ST) (SZ)

\*ANGUS and VELARDE are one test because these detonations occurred within the time frame and proximity as defined by treaty. They are listed separately because of individual test data.

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**Test: COLMOR**

<b>Date:</b>	04/26/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	0715 PST	<b>Depth of Burial:</b>	806 ft
<b>Location:</b>	NTS U3hv	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $2.9 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $2.9 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $4.1 \times 10^{-8}$

---

**Release Summary:** A release occurred during cementback operations on May 3, 1973.

**References:** (B) (E) (H) (AD) (ST) (SZ)

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**Test: STARWORT**

<b>Date:</b>	04/26/73	<b>Sponsor:</b>	LLL
<b>Time:</b>	0915 PST	<b>Depth of Burial:</b>	1,850 ft
<b>Location:</b>	NTS U2bs	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	90 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 9.7

$^{133}\text{Xe}$  in curies: 9.6

$^{133\text{m}}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $2.7 \times 10^{-6}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 1235 hours on May 7, 1973.

**References:** (C) (E) (H) (AD)

---

**Test: MESITA**

<b>Date:</b>	05/09/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	490 ft
<b>Location:</b>	NTS U3jd	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $4.0 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $4.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $1.7 \times 10^{-8}$

---

**Release Summary:** A release occurred during cementback operations on May 17, 1973.

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**References:** (B) (E) (H) (AD) (ST) (SZ)

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**Test: KASHAN**

<b>Date:</b>	05/24/73	<b>Sponsor:</b>	LLL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	870 ft
<b>Location:</b>	NTS U10av	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.7 \times 10^2$

$^{133}\text{Xe}$  in curies:  $2.6 \times 10^2$

$^{133\text{m}}\text{Xe}$  in curies: 8.2

$^{135}\text{Xe}$  in curies: 2.4

---

**Release Summary:** A drillback release occurred from the ventilation line at 0420 hours on May 31, 1973, and lasted for 6.5 hours.

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**References:** (C) (E) (H) (AD) (VI)

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**Test: POTRILLO**

<b>Date:</b>	06/21/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	0745 PDT	<b>Depth of Burial:</b>	1,865 ft
<b>Location:</b>	NTS U7af	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $2.1 \times 10^{-4}$

$^{133}\text{Xe}$  in curies:  $2.1 \times 10^{-4}$

---

**Release Summary:** A release occurred during cementback operations between July 19 and 20, 1973.

---

**References:** (E) (H) (AD) (ST) (SZ)

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**Test: PORTULACA**

<b>Date:</b>	06/28/73	<b>Sponsor:</b>	LLL
<b>Time:</b>	1215 PDT	<b>Depth of Burial:</b>	1,530 ft
<b>Location:</b>	NTS U2bv	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release:** Some

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**Release Summary:** There was no release of radioactivity through the ventilation line system. A small undocumented release was detected from the drill casing after the rig was removed on July 6, 1973, at 2130 hours.

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**References:** (E) (H) (X) (AD) (LI)

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**Test: WALLER**

<b>Date:</b>	10/02/73	<b>Sponsor:</b>	LLL
<b>Time:</b>	0815 PDT	<b>Depth of Burial:</b>	1,017 ft
<b>Location:</b>	NTS U2bz	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

**Drillback Release Activity at Time of Release, in Curies: 3.0**

$^{133}\text{Xe}$  in curies: 1.9

$^{133\text{m}}\text{Xe}$  in curies:  $7.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $3.1 \times 10^{-1}$

---

**Gas Sampling Release Activity at R+12 hours in Curies:  $6.0 \times 10^{-3}$**

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**Release Summary:** Drillback releases occurred from the ventilation line at 1045 hours on October 5, 1973, lasting for seven minutes and at 1846 hours on October 5, 1973, lasting for eight minutes.

Two uncontrolled releases occurred from the gas sampling skid on October 5, 1973.

---

**References:** (C) (E) (H) (X) (AE) (Q3)

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<b>Test:</b>	<b>BERNAL</b>		
<b>Date:</b>	11/28/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	928 ft
<b>Location:</b>	NTS U3jy	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:  $1.4 \times 10^{-1}$**

$^{133}\text{Xe}$  in curies:  $1.4 \times 10^{-1}$

---

**Release Summary:** A release occurred January 16, 1974, during postshot cementing operations.

---

**References:** (E) (H) (AE) (RA) (ST) (SX)

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<b>Test:</b>	<b>PAJARA</b>		
<b>Date:</b>	12/12/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	1100 PST	<b>Depth of Burial:</b>	912 ft
<b>Location:</b>	NTS U3ji	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Drillback Release Activity at Time of Release, in Curies: 5.3**

$^{133}\text{Xe}$  in curies: 5.3

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**Release Summary:** A release occurred during cementback operations between January 11 and 14, 1974.

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**References:** (E) (H) (AE) (ST) (SX)

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**Test:** **SEAFOAM**

<b>Date:</b>	12/13/73	<b>Sponsor:</b>	LLL
<b>Time:</b>	0717 PST	<b>Depth of Burial:</b>	650 ft
<b>Location:</b>	NTS U2ea	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity in Curies:** 4.5

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**Release Summary:** A release occurred from the prompt gas sampling line at 0737 hours on December 13, 1973, and lasted for 14 minutes.

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**References:** (C) (E) (H) (AE) (QJ)

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**Test:** **ELIDA**

<b>Date:</b>	12/19/73	<b>Sponsor:</b>	LASL
<b>Time:</b>	1116 PST	<b>Depth of Burial:</b>	1,250 ft
<b>Location:</b>	NTS U3hy	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $7.9 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $7.9 \times 10^{-1}$

---

**Release Summary:** A cementback release occurred between January 8 and 9, 1974.

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**References:** (E) (H) (AE) (ST) (SX)

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**Detonation:** **PINEDROPS-BAYOU**  
(simultaneous with PINEDROPS-SLOAT and -TAWNY, same hole)

<b>Date:</b>	01/10/74	<b>Sponsor:</b>	LLL
<b>Time:</b>	0838 PDT	<b>Depth of Burial:</b>	1,125 ft
<b>Location:</b>	NTS U10as	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 6.0

$^{133}\text{Xe}$  in curies: 2.5

$^{133\text{m}}\text{Xe}$  in curies:  $1.2 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 3.4

---

**Release Summary:** Drillback releases occurred from the ventilation line at 0729 hours on January 12, 1974, lasting for 31 minutes, and at 0700 hours on January 13, 1974, lasting for six minutes.

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**References:** (C) (E) (H) (AE) (QK)

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**Test:** **HULSEA**

<b>Date:</b>	03/14/74	<b>Sponsor:</b>	LLL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	640 ft
<b>Location:</b>	NTS U2bx	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $6.7 \times 10^1$

$^{133}\text{Xe}$  in curies:  $3.9 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.6

$^{135}\text{Xe}$  in curies:  $2.6 \times 10^1$

---

**Release Summary:** A drillback release occurred at 0900 hours on March 16, 1974, and lasted for 49 hours.

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**References:** (C) (E) (H) (AE) (QL)

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**Test: GROVE**

<b>Date:</b>	05/22/74	<b>Sponsor:</b>	LLL
<b>Time:</b>	0715 PDT	<b>Depth of Burial:</b>	1,027 ft
<b>Location:</b>	NTS U2ds	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:  $2.6 \times 10^1$**  $^{133}\text{Xe}$  in curies:  $2.5 \times 10^1$  $^{133\text{m}}\text{Xe}$  in curies:  $6.3 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $4.7 \times 10^{-2}$ 

**Release Summary:** A drillback release occurred from the ventilation line at 1040 hours on May 26, 1974, lasting for three minutes, and at 1549 hours on May 28, 1974, lasting for 14.5 minutes.

**References:** (C) (E) (H) (AE) (QM)**Test: FALLON**

<b>Date:</b>	05/23/74	<b>Sponsor:</b>	LLL/UK
<b>Time:</b>	0638 PDT	<b>Depth of Burial:</b>	1,529 ft
<b>Location:</b>	NTS U2dv	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:  $7.2 \times 10^1$**  $^{133}\text{Xe}$  in curies:  $7.0 \times 10^1$  $^{133\text{m}}\text{Xe}$  in curies: 1.8 $^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$ 

**Release Summary:** Drillback releases occurred from the ventilation line as follows: (1) at 0525 hours on May 29, 1974, lasting for 22 minutes; (2) at 0636 hours on May 29, 1974, lasting for 17 minutes; (3) at 0703 hours on May 29, 1974, lasting for 10 minutes; (4) at 0743 hours on May 29, 1974, lasting for 12 minutes; (5) at 0835 hours on May 29, 1974, lasting for 10 minutes; (6) at 1324 hours on May 29, 1974, lasting for 12 minutes; and (7) at 0547 hours on May 30, 1974, lasting for 7 minutes.

**References:** (C) (E) (H) (AE) (NX)

<b>Test:</b>	<b>JARA</b>		
<b>Date:</b>	06/06/74	<b>Sponsor:</b>	LASL
<b>Time:</b>	0740 PDT	<b>Depth of Burial:</b>	1,240 ft
<b>Location:</b>	NTS U3hp	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

**Cementback Release Activity at Time of Release, in Curies:**  $2.6 \times 10^{-4}$

$^{133}\text{Xe}$  in curies:  $2.6 \times 10^{-4}$

**Release Summary:** A cementback release occurred through the filtering system on July 1 and 2, 1974.

**References:** (E) (H) (AE) (ST) (SX)

<b>Test:</b>	<b>ESCABOSA</b>		
<b>Date:</b>	07/10/74	<b>Sponsor:</b>	LASL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	2,100 ft
<b>Location:</b>	NTS U7ac	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

**Cementback Release Activity at Time of Release, in Curies:**  $5.3 \times 10^{-4}$

$^{133}\text{Xe}$  in curies:  $5.3 \times 10^{-4}$

**Release Summary:** A cementback release occurred from the postshot drilling hole from July 31, to August 1, 1974.

**References:** (E) (H) (AF) (RB) (ST) (SX)

<b>Detonations:</b>	<b>CRESTLAKE-TANSAN, -BRIAR</b> (simultaneous, same hole)		
<b>Date:</b>	07/18/74	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	892 ft; 1,229 ft
<b>Location:</b>	NTS U2dw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $1.9 \times 10^1$**  $^{133}\text{Xe}$  in curies:  $1.6 \times 10^1$  $^{133\text{m}}\text{Xe}$  in curies:  $6.4 \times 10^{-1}$  $^{135}\text{Xe}$  in curies: 2.3

---

**Release Summary:** A drillback release occurred from the ventilation line at 1630 hours on July 21, 1974, and lasted for 3.5 hours.

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**References:** (C) (E) (H) (X) (AF) (QN)

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<b>Test:</b>	<b>PUYE</b>		
<b>Date:</b>	08/14/74	<b>Sponsor:</b>	LASL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,411 ft
<b>Location:</b>	NTS U3jl	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Cementback

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**Drillback Release Activity at Time of Release, in Curies:  $1.5 \times 10^{-2}$**  $^{133}\text{Xe}$  in curies:  $1.5 \times 10^{-2}$  $^{135}\text{Xe}$  in curies:  $2.1 \times 10^{-4}$  $^{131}\text{I}$  in curies:  $2.1 \times 10^{-6}$  $^{133}\text{I}$  in curies:  $8.6 \times 10^{-7}$  $^{135}\text{I}$  in curies:  $2.5 \times 10^{-9}$ 

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**Cementback Release Activity at Time of Release, in Curies: 3.7** $^{133}\text{Xe}$  in curies: 3.7

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**Release Summary:** A drillback release occurred on August 21, 1974, from the postshot drilling hole, and a cementback release occurred from September 11-12, 1974, from the same drilling hole.

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**References:** (E) (H) (Y) (AF) (RC) (RD) (ST) (SX)

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**Test: HYBLA FAIR**

<b>Date:</b>	10/28/74	<b>Sponsor:</b>	DoD/LLL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	1,325 ft
<b>Location:</b>	NTS U12n.09	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at Time of Release, in Curies:**  $5.0 \times 10^2$ **Controlled Release Activity at R+12 Hours, in Curies:**  $5.0 \times 10^2$ **Isotopes Detected in Release:**  $^{133}\text{Xe}$  and  $^{133\text{m}}\text{Xe}$ 

**Release Summary:** A release occurred from the area between overburden plug (OBP) No. 1 and OBP No. 2 from November 13 to November 14, 1974. Stemming failed during the test and noble gases seeped through or around OBP No. 2. All activity was successfully contained inside OBP No. 1. Effluent released during the controlled ventilation of the tunnel complex was the activity contained between OBP No. 1 and OBP No. 2 only. Activity was 99%  $^{133}\text{Xe}$ , with the remainder of activity being  $^{133\text{m}}\text{Xe}$ . A second release occurred from the U12n.09 drift complex from November 20, 1974, to January 6, 1975. Activity released was passed through a high-efficiency particulate and aerosol filter before being released through the tunnel ventilation system. Effluent was 99%  $^{133}\text{Xe}$  with some  $^{133\text{m}}\text{Xe}$ .

**References:** (E) (H) (L) (AF)**Test: TEMESCAL**

<b>Date:</b>	11/02/74	<b>Sponsor:</b>	LLL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	859 ft
<b>Location:</b>	NTS U4ab	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

**Gas Sampling Release Activity at R+12 Hours, in Curies:** 1.6

$^{133}\text{Xe}$  in curies: 1.0  
 $^{133\text{m}}\text{Xe}$  in curies:  $4.0 \times 10^{-2}$   
 $^{135}\text{Xe}$  in curies:  $1.2 \times 10^{-1}$   
 $^3\text{H}$  in curies:  $4.0 \times 10^{-1}$   
 $^{131}\text{I}$  in curies:  $4.0 \times 10^{-3}$

**Release Summary:** A gas sampling release occurred at 0800 hours on November 2, 1974, through the in-line filter in the sampling skid. A second release occurred on November 6, 1974, through a hydrogen analyzer.

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**References:** (C) (E) (H) (AF) (QP)

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<b>Detonations:</b>	<b>PORTOLA, PORTOLA-LARKIN</b> (simultaneous, same hole)		
<b>Date:</b>	02/06/75	<b>Sponsor:</b>	LLL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	649 ft, 899 ft
<b>Location:</b>	NTS U10bb	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 9.7

$^{133}\text{Xe}$  in curies: 9.6

$^{133\text{m}}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.5 \times 10^{-5}$

---

**Release Summary:** Four documented releases from the ventilation line occurred on February 17, 1975, as follows: (1) starting at 0312 hours and lasting for nine minutes; (2) starting at 0422 hours and lasting for six minutes; (3) starting at 0449 hours and lasting for ten minutes; and (4) starting at 0526 hours and lasting for seven minutes.

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**References:** (C) (E) (H) (AF) (QQ)

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<b>Test:</b>	<b>BILGE</b>		
<b>Date:</b>	02/19/75	<b>Sponsor:</b>	LASL
<b>Time:</b>	1110 PST	<b>Depth of Burial:</b>	1,046 ft
<b>Location:</b>	NTS U3kc	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

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**Cementback Release Activity at Time of Release, in Curies:**  $9.1 \times 10^{-4}$

$^{133}\text{Xe}$  in curies:  $9.1 \times 10^{-4}$

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**Release Summary:** A release occurred during cementback operations between 1830 and 1940 hours on April 16, 1975.

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**References:** (E) (H) (AF) (QI) (QR) (TA) (TB)

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**Test: CABRILLO**

<b>Date:</b>	03/07/75	<b>Sponsor:</b>	LLL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	1,969 ft
<b>Location:</b>	NTS U2dr	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.1 \times 10^1$**  $^{133}\text{Xe}$  in curies:  $1.1 \times 10^1$  $^{133\text{m}}\text{Xe}$  in curies:  $2.2 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $1.8 \times 10^{-3}$ 

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**Release Summary:** Three drillback releases occurred from the ventilation line beginning at 1057 hours on March 15, 1975, and continued over a 46-minute period.

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**References:** (C) (E) (H) (AF) (NZ)

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**Test: KASSERI**

<b>Date:</b>	10/28/75	<b>Sponsor:</b>	LLL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	4,150 ft
<b>Location:</b>	NTS U20z	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	200 to 1000 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $2.4 \times 10^{-2}$**  $^{133}\text{Xe}$  in curies:  $2.4 \times 10^{-2}$ 

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**Release Summary:** Three releases occurred from the drilling platform as follows: (1) on November 24, 1975, for 25 seconds; (2) on November 30, 1975, for 28 minutes; and (3) on December 3, 1975, for 6.3 hours.

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**References:** (C) (E) (H) (X) (AG)

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**Test: ESROM**

<b>Date:</b>	02/04/76	<b>Sponsor:</b>	LLL
<b>Time:</b>	0640 PST	<b>Depth of Burial:</b>	2,149 ft
<b>Location:</b>	NTS U7ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 200 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $8.8 \times 10^1$

$^{133}\text{Xe}$  in curies:  $8.8 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $1.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-14}$  (trace)

---

**Release Summary:** Two releases occurred through the ventilation line between 1910 and 2220 hours on February 28, 1976.

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**References:** (C) (E) (H) (X) (AG) (L2)

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**Test: SHALLOWS**

<b>Date:</b>	02/26/76	<b>Sponsor:</b>	LASL
<b>Time:</b>	0650 PST	<b>Depth of Burial:</b>	800 ft
<b>Location:</b>	NTS U3jf	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $1.7 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $1.7 \times 10^{-2}$

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**Release Summary:** A cementback release occurred through the filtering system between 2230 and 2330 hours on March 11, 1976.

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**References:** (E) (H) (AG) (QI) (QS) (SY) (TC) (TE)

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<b>Test:</b>	<b>COLBY</b>		
<b>Date:</b>	03/14/76	<b>Sponsor:</b>	LLL
<b>Time:</b>	0430 PST	<b>Depth of Burial:</b>	4,178 ft
<b>Location:</b>	NTS U20aa	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	500 to 1000 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Mudpit

**Cementback Release Activity at Time of Release, in Curies:**  $4.4 \times 10^1$

$^{103}\text{Ru}$  in curies:  $3.8 \times 10^1$

$^{106}\text{Ru}/^{106}\text{Rh}$  in curies: 6.0

**Release Summary:** Overflow effluent from the mudpit occurred at 1625 hours on May 16, 1976, and flowed for 0.47 miles. Effluent was buried in the crater.

**References:** (C) (E) (H) (X) (AG) (CP)

<b>Test:</b>	<b>RIVOLI</b>		
<b>Date:</b>	05/20/76	<b>Sponsor:</b>	LLL
<b>Time:</b>	1030 PDT	<b>Depth of Burial:</b>	656 ft
<b>Location:</b>	NTS U2eg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test

**Test Release Activity at R+12 Hours:** Trace

$^{135}\text{Xe}$ : trace

**Release Summary:** A trace of  $^{135}\text{Xe}$ , released from surface ground zero, was detected on an M-102 air sampler at H+2.5 hours. This release lasted for one day.

**References:** (C) (E) (H) (X) (AH) (QT)

<b>Test:</b>	<b>BILLET</b>		
<b>Date:</b>	07/27/76	<b>Sponsor:</b>	LASL
<b>Time:</b>	1330 PDT	<b>Depth of Burial:</b>	2,087 ft
<b>Location:</b>	NTS U7an	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $8.0 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $8.0 \times 10^{-3}$

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**References:** (E) (H) (AG) (RE) (SY)

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**Test:** **BANON**

<b>Date:</b>	08/26/76	<b>Sponsor:</b>	LLL/UK
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	1,759 ft
<b>Location:</b>	NTS U2dz	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 6.0

$^{133}\text{Xe}$  in curies: 5.8

$^{133\text{m}}\text{Xe}$  in curies:  $1.6 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $3.5 \times 10^{-2}$

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**Release Summary:** Drillback releases occurred from the ventilation line as follows: (1) at 0854 hours on August 31, 1976, lasting for nine minutes; (2) at 0955 hours on August 31, 1976, lasting for three minutes; (3) at 1256 hours on August 31, 1976, lasting for two minutes; and (4) at 1446 hours on September 2, 1976, lasting for two minutes.

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**References:** (C) (E) (H) (AG) (O9)

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**Detonations:** **DOFINO, DOFINO-LAWTON** (simultaneous, same hole)

<b>Date:</b>	03/08/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0624 PST	<b>Depth of Burial:</b>	600 ft, 925 ft
<b>Location:</b>	NTS U10ba	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.5 \times 10^1$

$^{133}\text{Xe}$  in curies:  $2.4 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $5.7 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.5 \times 10^{-1}$

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**Release Summary:** Drillback releases occurred from the ventilation line as follows: (1) on March 12, 1977, beginning at 1503 hours and lasting for eight minutes; (2) on March 15, 1977,

beginning at 1509 hours and lasting for four minutes; and (3) on March 15, 1977, beginning at 2000 hours and lasting for 28 minutes.

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**References:** (C) (E) (H) (X) (AH) (QU)

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**Test:** **MARSILLY**

<b>Date:</b>	04/05/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	2,264 ft
<b>Location:</b>	NTS U2el	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.5 \times 10^1$

$^{133}\text{Xe}$  in curies:  $1.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $3.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $1.0 \times 10^{-2}$

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**Release Summary:** A drillback release occurred from the ventilation line on April 10, 1977, and lasted for eight minutes.

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**References:** (C) (E) (H) (AH) (OE)

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**Test:** **CARNELIAN**

<b>Date:</b>	07/28/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0707 PDT	<b>Depth of Burial:</b>	682 ft
<b>Location:</b>	NTS U4af	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 6.8

$^{133}\text{Xe}$  in curies: 4.7

$^{133\text{m}}\text{Xe}$  in curies:  $2.1 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 1.9

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**Release Summary:** A release occurred through the ventilation line on July 31, 1977, at 0001 hours and lasted for 11 minutes.

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**References:** (C) (E) (H) (X) (AH) (QV)

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**Detonation:** **GRUYERE-GRADINO**  
(simultaneous with GRUYERE, same hole)

<b>Date:</b>	08/16/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0741 PDT	<b>Depth of Burial:</b>	1,050 ft
<b>Location:</b>	NTS U9cg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at R+12 Hours\*, in Curies:**  $8.0 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $7.8 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.2 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $3.2 \times 10^{-3}$

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**Release Summary:** A drillback release occurred from the ventilation line at 0814 hours on August 21, 1977, and lasted for eight minutes.

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**References:** (E) (H) (AH) (QW) (QX)

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\*Release activity at time of release is not available.

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**Test:** **FLOTOST**

<b>Date:</b>	08/16/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0849 PDT	<b>Depth of Burial:</b>	902 ft
<b>Location:</b>	NTS U2ao	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 2.5

$^{133}\text{Xe}$  in curies: 2.5

$^{133\text{m}}\text{Xe}$  in curies:  $4.0 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $3.0 \times 10^{-5}$

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**Release Summary:** A release occurred from the ventilation line August 25, 1977, and lasted for two minutes.

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**References:** (E) (H) (X) (AH) (QY)

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**Test: COULOMMIERS**

<b>Date:</b>	09/27/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,739 ft
<b>Location:</b>	NTS U2ei	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $9.3 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $9.1 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.0 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $3.9 \times 10^{-4}$

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**Release Summary:** A drillback release occurred from the ventilation line at 0707 hours on October 3, 1977, and lasted for three minutes.

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**References:** (C)(E)(H)(AH)(O0)

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**Test: BOBSTAY**

<b>Date:</b>	10/26/77	<b>Sponsor:</b>	LASL
<b>Time:</b>	0715 PDT	<b>Depth of Burial:</b>	1,250 ft
<b>Location:</b>	NTS U3jb	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

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**Cementback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $2.0 \times 10^{-3}$

$^{131}\text{I}$  in curies:  $2.6 \times 10^{-6}$

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**References:** (E)(H)(AI)(RF)(SU)(SW)

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**Test: HYBLA GOLD**

<b>Date:</b>	11/01/77	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	1006 PST	<b>Depth of Burial:</b>	1,263 ft
<b>Location:</b>	NTS U12e.20	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

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**Controlled Release Activity at Time of Release, in Curies:**  $5.0 \times 10^{-3}$

**Controlled Release Activity at R+12 Hours, in Curies:**  $5.0 \times 10^{-3}$

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**Isotopes Detected in Release:**  $^{133}\text{Xe}$

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**Release Summary:** Activity was successfully contained inside the drift protection plug (DPP) until it had decayed to an insignificant level. A controlled release occurred on November 29, 1977.

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**References:** (E) (H) (L) (AI)

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**Test: FARALLONES**

<b>Date:</b>	12/14/77	<b>Sponsor:</b>	LLL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	2,192 ft
<b>Location:</b>	NTS U2fa	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 1.2

$^{133}\text{Xe}$  in curies: 1.1

$^{133\text{m}}\text{Xe}$  in curies:  $3.6 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $1.2 \times 10^{-2}$

---

**Release Summary:** A drillback release occurred from the drilling rig cellar. Xenon releases occurred through the filtering system at 0205 hours on December 19, 1977, and lasted approximately 10 minutes.

---

**References:** (E) (H) (AI) (O1)

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**Test: CAMPOS**

<b>Date:</b>	02/13/78	<b>Sponsor:</b>	LLL
<b>Time:</b>	1353 PST	<b>Depth of Burial:</b>	1,050 ft
<b>Location:</b>	NTS U9cp	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $1.3 \times 10^3$**  $^{133}\text{Xe}$  in curies:  $1.3 \times 10^3$  $^{133\text{m}}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $1.5 \times 10^{-2}$  $^{131}\text{I}$  in curies:  $2.6 \times 10^{-5}$ 

---

**Release Summary:** Drillback releases occurred from the ventilation line at 0223 hours on February 19, 1978, lasting for 30 minutes, and from the mud line "kill" valve at approximately 1200 hours on February 26, 1978, lasting for approximately 22 hours.

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**References:** (C) (E) (H) (X) (AI)

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**Test: REBLOCHON**

<b>Date:</b>	02/23/78	<b>Sponsor:</b>	LLL
<b>Time:</b>	0900 PST	<b>Depth of Burial:</b>	2,160 ft
<b>Location:</b>	NTS U2en	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $3.6 \times 10^1$**  $^{133}\text{Xe}$  in curies:  $3.5 \times 10^1$  $^{133\text{m}}\text{Xe}$  in curies: 1.1 $^{135}\text{Xe}$  in curies:  $3.6 \times 10^{-1}$ 

---

**Release Summary:** At 0645 hours on February 28, 1978, 15 mR/h was detected in the rig cellar. By 0650 hours, the cellar radiation level had increased to greater than 500 mR/h. The Hydril (part of the blow-out prevention system) was closed to contain the release. The activity from this release totalled 33 curies. A second release of 0.56 curies was detected at 1015 hours the same day. Shortly after the rotating head (part of the drilling system) was removed, a third release of 3.1 curies occurred at 1045 hours.

---

References: (C) (E) (H) (AI) (O2)

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<b>Test:</b>	<b>KARAB</b>		
<b>Date:</b>	03/16/78	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	1,086 ft
<b>Location:</b>	NTS U4ah	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $7.3 \times 10^{-5}$

$^{133}\text{Xe}$  in curies:  $7.0 \times 10^{-5}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.2 \times 10^{-6}$

$^{135}\text{Xe}$  in curies:  $7.0 \times 10^{-7}$

$^{131}\text{I}$  in curies:  $7.0 \times 10^{-8}$

---

**Release Summary:** A drillback release occurred from the gas sampling line on March 20, 1978, lasting for five minutes.

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References: (E) (H) (AI) (QZ)

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<b>Test:</b>	<b>SATZ</b>		
<b>Date:</b>	07/07/78	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,033 ft
<b>Location:</b>	NTS U2dq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.8 \times 10^{-4}$

$^3\text{H}$  in curies:  $1.7 \times 10^{-4}$

$^{85}\text{Kr}$  in curies:  $6.0 \times 10^{-6}$

---

**Release Summary:** A controlled gas sampling containment tank release occurred on October 26, 1982.

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References: (C) (E) (H) (X) (AI)

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**Test: QUARGEL**

<b>Date:</b>	11/18/78	<b>Sponsor:</b>	LLL/UK
<b>Time:</b>	1100 PST	<b>Depth of Burial:</b>	1,778 ft
<b>Location:</b>	NTS U2fb	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at R+12 Hours\*, in Curies: 6.7** $^{133}\text{Xe}$  in curies: 6.5 $^{133\text{m}}\text{Xe}$  in curies:  $1.6 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $9.0 \times 10^{-3}$ 

---

**Release Summary:** A drillback release occurred from the ventilation line at 1528 hours on November 24, 1978, and lasted for nine minutes.

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**References:** (C) (E) (H) (X) (AJ) (O3)

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\*Drillback release activity at the time of release is not available.

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**Test: FARM**

<b>Date:</b>	12/16/78	<b>Sponsor:</b>	LLL
<b>Time:</b>	0730 PST	<b>Depth of Burial:</b>	2,260 ft
<b>Location:</b>	NTS U20ab	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:  $3.0 \times 10^{-3}$**  $^3\text{H}$  in curies:  $2.9 \times 10^{-5}$  $^{85}\text{Kr}$  in curies:  $3.0 \times 10^{-3}$ 

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**Release Summary:** A controlled gas sampling containment tank release occurred on October 18, 1982.

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**References:** (C) (E) (H) (X) (AJ)

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**Test: KLOSTER**

<b>Date:</b>	02/15/79	<b>Sponsor:</b>	LLL
<b>Time:</b>	1005 PST	<b>Depth of Burial:</b>	1,759 ft
<b>Location:</b>	NTS U2eo	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $2.0 \times 10^{-2}$ 

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**Release Summary:** A drillback release occurred from the drill string at 1315 hours on February 21, 1979. Nine puffs of radioactive gases were released over a 30-hour period from this location.

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**References:** (C) (E) (H) (X) (AJ) (O4)

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**Test: PEPATO**

<b>Date:</b>	06/11/79	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	2,233 ft
<b>Location:</b>	NTS U20ad	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $1.0 \times 10^{-2}$ 

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**Release Summary:** Drillback releases occurred from the Hydril from 0505 to 0750 hours on June 22, 1979. There were a small number of intermittent releases for a total of 18 minutes when the Hydril was open.

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**References:** (C) (E) (H) (X) (AJ) (CZ)

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**Test: FAJY**

<b>Date:</b>	06/28/79	<b>Sponsor:</b>	LLL
<b>Time:</b>	0744 PDT	<b>Depth of Burial:</b>	1,759 ft
<b>Location:</b>	NTS U2fc	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:** Less than  $1.0 \times 10^{-2}$ 

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.0 \times 10^{-4}$

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**Release Summary:** Two drillback releases occurred from the open drill pipe on July 3, 1979. Two short-duration releases occurred when replacing the drill string.

A controlled gas sampling containment tank release occurred on October 26, 1982.

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**References:** (C) (E) (H) (X) (AJ)

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**Test:** **BURZET**

<b>Date:</b>	08/03/79	<b>Sponsor:</b>	LLL
<b>Time:</b>	0807 PDT	<b>Depth of Burial:</b>	1,476 ft
<b>Location:</b>	NTS U4ai	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.0 \times 10^{-2}$

$^3\text{H}$  in curies:  $3.0 \times 10^{-2}$

$^{85}\text{Kr}$  in curies:  $2.3 \times 10^{-5}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on December 14, 1982.

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**References:** (C) (E) (H) (X) (AJ)

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**Test:** **NESSSEL**

<b>Date:</b>	08/29/79	<b>Sponsor:</b>	LLL/UK
<b>Time:</b>	0808 PDT	<b>Depth of Burial:</b>	1,522 ft
<b>Location:</b>	NTS U2ep	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $2.3 \times 10^{-2}$

$^3\text{H}$  in curies:  $2.3 \times 10^{-2}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on December 13, 1982.

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**References:** (C) (E) (H) (X) (AJ)

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<b>Test:</b>	<b>TARKO</b>		
<b>Date:</b>	02/28/80	<b>Sponsor:</b>	LLL
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	1,211 ft
<b>Location:</b>	NTS U2fd	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

**Drillback Release Activity at Time of Release, in Curies:**  $5.0 \times 10^1$

$^{133}\text{Xe}$  in curies:  $4.3 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.7

$^{135}\text{Xe}$  in curies: 5.2

**Gas Sampling Release Activity at Time of Release, in Curies:**  $4.6 \times 10^{-2}$

$^3\text{H}$  in curies:  $4.5 \times 10^{-2}$

$^{85}\text{Kr}$  in curies:  $5.6 \times 10^{-4}$

**Release Summary:** A drillback release occurred from the postshot drill hole at 2018 hours on March 2, 1980, lasting for 20 minutes.

A controlled gas sampling containment tank release occurred on December 13, 1982.

**References:** (E) (H) (AK) (C) (C0) (O5) (RG)

<b>Test:</b>	<b>NORBO</b>		
<b>Date:</b>	03/08/80	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0735 PST	<b>Depth of Burial:</b>	889 ft
<b>Location:</b>	NTS U8c	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test and Gas Sampling

**Test Release at Time of Release, in Curies:**  $5.0 \times 10^{-2}$

**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.6 \times 10^{-2}$

$^3\text{H}$  in curies:  $1.5 \times 10^{-2}$

$^{85}\text{Kr}$  in curies:  $6.8 \times 10^{-4}$

**Release Summary:** A test release from the gas sampling system occurred at H+23 minutes and lasted for 18 minutes.

A controlled gas sampling containment tank release occurred on December 6, 1982.

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**References:** (E) (H) (X) (AK) (C0)

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<b>Test:</b>	<b>COLWICK</b>		
<b>Date:</b>	04/26/80	<b>Sponsor:</b>	LLNL/UK
<b>Time:</b>	0900 PST	<b>Depth of Burial:</b>	2,077 ft
<b>Location:</b>	NTS U20ac	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $7.5 \times 10^{-3}$

$^3\text{H}$  in curies:  $1.4 \times 10^{-5}$

$^{85}\text{Kr}$  in curies:  $7.5 \times 10^{-3}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on October 18, 1982.

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**References:** (E) (H) (X) (AK) (C0)

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<b>Test:</b>	<b>FLORA</b>		
<b>Date:</b>	05/22/80	<b>Sponsor:</b>	LASL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	1,099 ft
<b>Location:</b>	NTS U31g	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^3$

$^{133}\text{Xe}$  in curies:  $1.0 \times 10^3$

$^{131}\text{I}$  in curies: 1.0

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**Release Summary:** A release occurred during dismantling of postshot drilling equipment on August 5, 1980.

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**References:** (E) (H) (AK) (RH)

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<b>Test:</b>	<b>KASH</b>		
<b>Date:</b>	06/12/80	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1015 PDT	<b>Depth of Burial:</b>	2,116 ft
<b>Location:</b>	NTS U20af	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $2.3 \times 10^{-4}$

$^3\text{H}$  in curies:  $2.4 \times 10^{-6}$

$^{85}\text{Kr}$  in curies:  $2.3 \times 10^{-4}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on October 18, 1982.

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**References:** (E) (H) (X) (AK) (C0)

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<b>Test:</b>	<b>TAFI</b>		
<b>Date:</b>	07/25/80	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1205 PST	<b>Depth of Burial:</b>	2,231 ft
<b>Location:</b>	NTS U20ae	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.6 \times 10^{-3}$

$^3\text{H}$  in curies:  $9.8 \times 10^{-5}$

$^{85}\text{Kr}$  in curies:  $1.5 \times 10^{-3}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on October 18, 1982.

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**References:** (E) (H) (X) (AK) (C0)

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<b>Test:</b>	<b>VERDELLO</b>		
<b>Date:</b>	07/31/80	<b>Sponsor:</b>	LASL
<b>Time:</b>	1119 PDT	<b>Depth of Burial:</b>	1,200 ft
<b>Location:</b>	NTS U3ku	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Cementback

**Drillback and Cementback Release Activity at Time of Release, in Curies:**  $4.5 \times 10^1$

$^{133}\text{Xe}$  in curies:  $4.5 \times 10^1$

$^{131}\text{I}$  in curies:  $7.0 \times 10^{-3}$

**Release Summary:** A release occurred between August 15 and 22, 1980, during postshot drilling and cementing operations.

**References:** (E) (H) (AK) (RI)

<b>Test:</b>	<b>RIOLA</b>		
<b>Date:</b>	09/25/80	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0826 PDT	<b>Depth of Burial:</b>	1,391 ft
<b>Location:</b>	NTS U2eq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	1.07 kt
<b>Release Detected:</b>	Offsite (Test Only)	<b>Type of Release:</b>	Test, Seepage, and Gas Sampling

**Test Release at R+12 Hours, in Curies:**  $9.6 \times 10^2$  (mixed fission products)

**Natural Seepage at Time of Release, in Curies:**  $2.2 \times 10^3$  (tritium and tritiated water)

**Isotopes Identified in the Release:**  $^{85\text{m}}\text{Kr}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ ,  $^{135}\text{Xe}$ ,  $^{135\text{m}}\text{Xe}$ , tritium, and tritiated water

**Maximum Activity Detected in Air Offsite:** 34 picocuries of  $^{133}\text{Xe}$  per cubic meter of air and 360 picocuries of  $^{135}\text{Xe}$  per cubic meter of air at Lathrop Wells, Nevada

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were measured.

**Maximum Iodine Level Detected Offsite:** No iodines were detected in any samples.

**Maximum Distance Radiation Detected Offsite:** No radiation intensities above background levels were measured.

**Gas Sampling Release at Time of Release, in Curies: 9.8** $^3\text{H}$  in curies: 9.8 $^{85}\text{Kr}$  in curies:  $1.5 \times 10^{-4}$ 

**Release Summary:** A test release and seepage from the surface ground zero area occurred at H+10 hours and 59 minutes. The test release, consisting of xenons and kryptons, occurred through surface ground zero cracks and lasted until 1020 hours on September 26, 1980. Seepage continued until it was no longer positively quantified in March 1981. The seepage rate varied throughout the period as it was affected by atmospheric pressure changes.

A controlled gas sampling containment tank release occurred on December 6, 1982.

**References:** (E) (H) (I) (X) (Z) (AK) (C0) (HY) (RJ)

**Test: MINERS IRON**

<b>Date:</b>	10/31/80	<b>Sponsor:</b>	DoD/LASL
<b>Time:</b>	1000 PST	<b>Depth of Burial:</b>	1,280 ft
<b>Location:</b>	NTS U12n.11	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at time of Release, in Curies:**  $3.0 \times 10^{-1}$

**Controlled Release Activity at R+12 Hours, in Curies:**  $1.0 \times 10^{-1}$

**Isotopes Detected in Release:**  $^{133\text{m}}\text{Xe}$  and  $^{135}\text{Xe}$

**Release Summary:** A controlled release occurred from H+49.5 hours until H+67 hours. Prior to that time, seepage from the stemming area into the open part of the LOS pipe had occurred. The effluent was 87%  $^{135}\text{Xe}$  and 13%  $^{133\text{m}}\text{Xe}$ . The activity was contained within the LOS pipe until controlled ventilation of the LOS pipe was established. The release point was the N Tunnel mesa vent hole.

**References:** (E) (H) (L) (AL) (RK)

**Test: VIDE**

<b>Date:</b>	04/30/81	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0735 PDT	<b>Depth of Burial:</b>	1,060 ft
<b>Location:</b>	NTS U8k	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

**Gas Sampling Release Activity at Time of Release, in Curies: 2.6**

$^{133}\text{Xe}$  in curies: 2.6

$^{135}\text{Xe}$  in curies:  $4.0 \times 10^{-2}$

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**Gas Sampling Release Activity at Time of Release, in Curies:  $5.2 \times 10^{-1}$  (Controlled)**

$^3\text{H}$  in curies:  $5.2 \times 10^{-1}$

$^{85}\text{Kr}$  in curies:  $4.5 \times 10^{-4}$

$^{137}\text{Cs}$  in curies:  $8.0 \times 10^{-6}$

---

**Release Summary:** A release occurred during a gas sampling operation on May 4, 1981, at 2013 hours and lasted for three minutes.

A second gas sampling release occurred on December 6, 1982. This controlled release was from the containment tank.

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**References:** (E) (H) (X) (AL) (C0) (OW) (RL)

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<b>Test:</b>	<b>NIZA</b>		
<b>Date:</b>	07/10/81	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,119 ft
<b>Location:</b>	NTS U9cr	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

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**Drillback Release Activity at Time of Release: Slight**

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**Gas Sampling Release Activity at Time of Release, in Curies:  $7.1 \times 10^{-4}$**

$^3\text{H}$  in curies:  $6.9 \times 10^{-4}$

$^{85}\text{Kr}$  in curies:  $1.5 \times 10^{-5}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on November 1, 1982.

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**References:** (E) (H) (X) (C0) (AL)

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<b>Test:</b>	<b>ISLAY</b>		
<b>Date:</b>	08/27/81	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0731 PDT	<b>Depth of Burial:</b>	965 ft
<b>Location:</b>	NTS U2er	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $7.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $7.0 \times 10^2$

**Release Summary:** Release of radioactivity occurred during drillback operations; 700 curies of xenon were released when the drilling mud "kill" line was opened, and an additional 0.34 curies of xenon were released during other drillback operations. The releases occurred between 0400 and 0613 hours on August 30, 1981.

**References:** (E) (H) (X) (C0) (AL) (RM)

<b>Test:</b>	<b>TREBBIANO</b>		
<b>Date:</b>	09/04/81	<b>Sponsor:</b>	LANL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	1,001 ft
<b>Location:</b>	NTS U3lj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $2.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $2.0 \times 10^2$

$^{131}\text{I}$  in curies:  $5.0 \times 10^{-2}$

**References:** (E) (H) (AL) (RN)

<b>Test:</b>	<b>TILCI</b>		
<b>Date:</b>	11/11/81	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1200 PST	<b>Depth of Burial:</b>	1,460 ft
<b>Location:</b>	NTS U4ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.0 \times 10^{-3}$

$^3\text{H}$  in curies:  $2.4 \times 10^{-3}$

$^{85}\text{Kr}$  in curies:  $6.0 \times 10^{-4}$

---

**Release Summary:** A controlled gas sampling containment tank release occurred on October 26, 1982.

---

**References:** (E) (H) (X) (AM) (C0)

---

**Test:** **AKAVI**

**Date:** 12/03/81

**Sponsor:** LLNL

**Time:** 0700 PST

**Depth of Burial:** 1,621 ft

**Location:** NTS U2es

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** 20 to 150 kt

**Release Detected:** Onsite Only

**Type of Release:** Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $4.6 \times 10^{-4}$

$^3\text{H}$  in curies:  $6.6 \times 10^{-6}$

$^{85}\text{Kr}$  in curies:  $4.5 \times 10^{-4}$

---

**Release Summary:** A controlled gas sampling containment tank release occurred on October 26, 1982.

---

**References:** (E) (H) (X) (AM) (C0)

---

**Test:** **CABOC**

**Date:** 12/16/81

**Sponsor:** LLNL

**Time:** 1305 PST

**Depth of Burial:** 1,100 ft

**Location:** NTS U2cp

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** Less than 20 kt

**Release Detected:** Onsite Only

**Type of Release:** Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.9 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $1.8 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $7.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-1}$

---

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.1 \times 10^{-4}$  $^3\text{H}$  in curies:  $6.8 \times 10^{-6}$  $^{85}\text{K}$  in curies:  $3.0 \times 10^{-4}$ 

---

**Release Summary:** Two releases occurred through the ventilation line during postshot drilling as follows: (1) at 1807 hours on December 18, 1981, from the Postshot No. 1A drill hole, releasing 0.21 curies of xenon; and (2) at 0130 hours on December 21, 1981, from the Postshot No. 2A drill hole, releasing 0.086 curies of xenon.

A controlled gas sampling containment tank release occurred on December 6, 1982.

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**References:** (E) (H) (AM) (C0) (O6) (RO)

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**Test: MOLBO**

<b>Date:</b>	02/12/82	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0655 PST	<b>Depth of Burial:</b>	2,093 ft
<b>Location:</b>	NTS U20ag	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.9 \times 10^{-3}$  $^3\text{H}$  in curies:  $7.5 \times 10^{-5}$  $^{85}\text{Kr}$  in curies:  $3.8 \times 10^{-3}$ 

---

**Release Summary:** A controlled gas sampling containment tank release occurred on October 18, 1982.

---

**References:** (E) (H) (X) (AM) (C0)

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**Test: GIBNE**

<b>Date:</b>	04/25/82	<b>Sponsor:</b>	LLNL/UK
<b>Time:</b>	1105 PDT	<b>Depth of Burial:</b>	1,870 ft
<b>Location:</b>	NTS U20ah	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $9.4 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $9.2 \times 10^{-2}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $8.0 \times 10^{-5}$

---

**Release Summary:** A release occurred through the ventilation line on May 1, 1982, at 2130 hours lasting for 22.5 minutes, while pulling the drill string out of the hole.

---

**References:** (E) (H) (X) (AM) (O7) (RP)

---

**Test:** **BOUSCHET**

<b>Date:</b>	05/07/82	<b>Sponsor:</b>	LANL
<b>Time:</b>	1117 PDT	<b>Depth of Burial:</b>	1,850 ft
<b>Location:</b>	NTS U3la	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:** Less than 1.0

xenons in curies: less than 1.0

iodines in curies: less than  $1.0 \times 10^{-4}$

---

**Release Summary:** A release occurred during cementback operations at approximately 1800 hours on June 10, 1982.

---

**References:** (E) (H) (J) (AM) (OP) (OQ) (RQ)

---

**Test:** **MONTEREY**

<b>Date:</b>	07/29/82	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1305 PDT	<b>Depth of Burial:</b>	1,310 ft
<b>Location:</b>	NTS U4aj	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.4 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $4.6 \times 10^{-2}$

$^{133\text{m}}\text{Xe}$  in curies:  $2.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $6.0 \times 10^{-3}$

---

**Release Summary:** A drillback release occurred from the ventilation line at 2319 hours on August 1, 1982.

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**References:** (E) (H) (X) (AM) (O8)

---

**Test:** **HURON LANDING\*** (simultaneous with **DIAMOND ACE**)

<b>Date:</b>	09/23/82	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	1,340 ft
<b>Location:</b>	NTS U12n.15	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

---

**Controlled Release Activity at Time of Release, in Curies:**  $2.8 \times 10^2$

**Controlled Release Activity at R+12 Hours, in Curies:**  $1.2 \times 10^2$

---

**Isotopes Detected in Release:**  $^{85m}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{133}\text{Xe}$ ,  $^{133m}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**Release Summary:** A controlled ventilation of the tunnel occurred from H+27.8 hours until H+36 hours. Prior to that time, activity had been contained inside the OBP until ventilation could be established to the mesa. The release point was the N Tunnel mesa vent hole. The effluent was 86%  $^{135}\text{Xe}$ , 7%  $^{85m}\text{Kr}$ , 3%  $^{133}\text{Xe}$ , 3%  $^{133m}\text{Xe}$ , and 1%  $^{88}\text{Kr}$ .

---

**References:** (E) (H) (W) (AM) (RS)

---

**Test:** **DIAMOND ACE\*** (simultaneous with **HURON LANDING**)

<b>Date:</b>	09/23/82	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	1,335 ft
<b>Location:</b>	NTS U12n.15	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

---

**Controlled Release Activity at Time of Release, in Curies:** Included in HURON LANDING data.

**Controlled Release Activity at R+12 Hours, in Curies:** Included in HURON LANDING data.

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**Isotopes Detected in Release:** Same as for HURON LANDING.

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**Release Summary:** Same as for HURON LANDING.

---

**References:** (E) (H) (W) (AM) (RS)

\*Tests were detonated simultaneously but are considered separate tests. Release data from each individual test is not available.

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<b>Test:</b>	<b>FRISCO</b>		
<b>Date:</b>	09/23/82	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,480 ft
<b>Location:</b>	NTS U8m	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 1.7

$^{133}\text{Xe}$  in curies: 1.6

$^{133\text{m}}\text{Xe}$  in curies:  $4.4 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $6.6 \times 10^{-3}$

---

**Release Summary:** Fourteen intermittent releases occurred starting at 1530 hours on September 27, 1982, through 1226 hours on September 30, 1982, for a total release time of 36.2 minutes.

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**References:** (E) (H) (X) (AM) (CQ) (RT)

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<b>Test:</b>	<b>MANTECA</b>		
<b>Date:</b>	12/10/82	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0720 PST	<b>Depth of Burial:</b>	1,355 ft
<b>Location:</b>	NTS U4al	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $7.8 \times 10^1$

$^{133}\text{Xe}$  in curies:  $7.1 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 2.5

$^{135}\text{Xe}$  in curies: 4.2

---

**Release Summary:** Twelve releases occurred intermittently from 1855 hours on December 12, 1982, to 0810 hours on December 14, 1982, for a total release time of approximately 1.7 hours.

---

**References:** (E) (H) (X) (AN) (C0)

---

<b>Test:</b>	<b>CHEEDAM</b>		
<b>Date:</b>	02/17/83	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0900 PST	<b>Depth of Burial:</b>	1,125 ft
<b>Location:</b>	NTS U2et	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.1 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $1.8 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $7.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $2.0 \times 10^{-2}$

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $7.7 \times 10^{-4}$

$^3\text{H}$  in curies:  $1.6 \times 10^{-4}$

$^{85}\text{Kr}$  in curies:  $6.0 \times 10^{-4}$

$^{137}\text{Cs}$  in curies:  $8.0 \times 10^{-6}$

---

**Release Summary:** A drillback release occurred from the ventilation line through the "kill" line at 2224 hours on February 20, 1983, lasting for 21 minutes.

A controlled gas sampling containment tank release occurred on December 6, 1983.

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**References:** (E) (H) (X) (AN) (C0) (OA) (RU)

---

<b>Test:</b>	<b>TURQUOISE</b>		
<b>Date:</b>	04/14/83	<b>Sponsor:</b>	LANL
<b>Time:</b>	1105 PST	<b>Depth of Burial:</b>	1,749 ft
<b>Location:</b>	NTS U7bu	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

---

**Cementback Release Activity at Time of Release, in Curies:**  $5.0 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $5.0 \times 10^{-3}$

$^{131}\text{I}$  in curies:  $2.5 \times 10^{-6}$

---

**Release Summary:** A release occurred on May 18, 1983.

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**References:** (E) (H) (AN) (RV)

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**Test:** **ARMADA**

<b>Date:</b>	04/22/83	<b>Sponsor:</b>	LLNL/UK
<b>Time:</b>	0553 PST	<b>Depth of Burial:</b>	869 ft
<b>Location:</b>	NTS U9cs	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $2.2 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $1.4 \times 10^{-2}$

$^{133\text{m}}\text{Xe}$  in curies:  $6.2 \times 10^{-4}$

$^{135}\text{Xe}$  in curies:  $7.1 \times 10^{-3}$

---

**Release Summary:** A small release occurred on April 24, 1983, at 2223 hours that lasted for five minutes. The release occurred through the ventilation line while pulling the drill string out of the hole.

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**References:** (E) (H) (X) (AN) (OB) (RW)

---

**Test:** **CROWDIE**

<b>Date:</b>	05/05/83	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0820 PDT	<b>Depth of Burial:</b>	1,280 ft
<b>Location:</b>	NTS U2fe	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:** 7.0

$^{133}\text{Xe}$  in curies: 3.1

$^{133\text{m}}\text{Xe}$  in curies:  $1.4 \times 10^{-1}$

$^{135}\text{Xe}$  in curies: 3.8

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.8 \times 10^{-2}$

$^3\text{H}$  in curies:  $3.8 \times 10^{-2}$

$^{85}\text{Kr}$  in curies:  $3.0 \times 10^{-4}$

$^{127}\text{Xe}$  in curies:  $2.0 \times 10^{-6}$

---

**Release Summary:** Ten releases occurred through the ventilation line during coring operations, beginning at 0429 hours on May 7, 1983, and lasting for 182 minutes. An eleventh release occurred through the ventilation line beginning at 2113 hours on May 8, 1983, and lasting for four minutes.

A controlled gas sampling containment tank release occurred on December 6, 1983.

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**References:** (E) (H) (X) (AN) (C0) (OC) (RX)

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**Test: MINI JADE**

<b>Date:</b>	05/26/83	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	0730 PDT	<b>Depth of Burial:</b>	1,243 ft
<b>Location:</b>	NTS U12n.12	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

---

**Controlled Release Activity at Time of Release, in Curies:** 1.0

**Controlled Release Activity at R+12 Hours, in Curies:** 1.0

---

**Isotopes Detected in Release:**  $^{133}\text{Xe}$  and  $^{133\text{m}}\text{Xe}$

---

**Release Summary:** A controlled ventilation occurred from H+5.2 days until H+6.2 days. Prior to that time, activity had been contained inside the DPP until ventilation to the mesa had been established. The release point was the N Tunnel mesa vent hole. Effluent was 89%  $^{133}\text{Xe}$  and 11%  $^{133\text{m}}\text{Xe}$ .

---

**References:** (E) (H) (W) (AN) (RY)

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**Test: DANABLU**

<b>Date:</b>	06/09/83	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1010 PDT	<b>Depth of Burial:</b>	1,050 ft
<b>Location:</b>	NTS U2eu	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $8.2 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $7.1 \times 10^{-2}$

$^{135}\text{Xe}$  in curies:  $1.1 \times 10^{-2}$

---

**Release Summary:** A release occurred on June 12, 1983.

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**References:** (E) (H) (AN) (RZ)

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<b>Test:</b>	<b>LABAN</b>		
<b>Date:</b>	08/03/83	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0633 PDT	<b>Depth of Burial:</b>	1,070 ft
<b>Location:</b>	NTS U2ff	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.1 \times 10^1$

$^{133}\text{Xe}$  in curies:  $2.5 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies: 1.2

$^{135}\text{Xe}$  in curies:  $2.5 \times 10^1$

$^{131}\text{I}$  in curies:  $1.1 \times 10^{-5}$

$^{133}\text{I}$  in curies:  $2.5 \times 10^{-5}$

---

**Release Summary:** A release occurred from the drill hole on August 5, 1983 and lasted for 48 minutes. At the same time, a release of xenons only occurred through the ventilation line. Other releases through the ventilation line occurred at 0132 hours, 1030 hours, and 1040 hours on August 6, 1983.

Two planned releases of radioactive gas trapped above the drill hole plugs were vented at 0155 hours and 0420 hours on August 7, 1983. The ventilation line releases on August 6 and 7, 1983, totalled less than 0.3 curies.

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**References:** (E) (H) (AN) (OD) (SA)

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<b>Test:</b>	<b>JARLSBERG</b>		
<b>Date:</b>	08/27/83	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	656 ft
<b>Location:</b>	NTS U10ca	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---



**Gas Sampling Release Activity at Time of Release, in Curies:  $1.1 \times 10^1$**

$^3\text{H}$  in curies: 1.4  
 $^{133}\text{Xe}$  in curies:  $2.5 \times 10^{-2}$   
 $^{37}\text{Ar}$  in curies: 9.6

---

**Release Summary:** Seven intermittent releases occurred during postshot drilling operations from February 2-5, 1984, for a total release time of approximately 66 minutes.

Releases (controlled) from the gas sampling containment tank occurred on March 23, 1984, and April 18, 1984.

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**References:** (E) (H) (I) (X) (AO) (CR) (SC)

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**Test: AGRINI**

<b>Date:</b>	03/31/84	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	1,050 ft
<b>Location:</b>	NTS U2ev	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Test, Controlled and Drillback

---

**Test Release at R+12 Hours, in Curies:  $6.9 \times 10^2$**

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**Isotopes Identified in the Release:**  $^{85\text{m}}\text{Kr}$ ,  $^{87}\text{Kr}$ ,  $^{88}\text{Kr}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{135\text{m}}\text{Xe}$

---

**Controlled Release Activity at Time of Release, in Curies:  $3.0 \times 10^{-2}$**

$^3\text{H}$  in curies:  $2.8 \times 10^{-2}$   
 $^{133}\text{Xe}$  in curies:  $2.8 \times 10^{-4}$   
 $^{37}\text{Ar}$  in curies:  $1.6 \times 10^{-3}$

---

**Drillback Release Activity at Time of Release, in Curies:  $2.0 \times 10^{-3}$**

xenons in curies:  $2.0 \times 10^{-3}$

---

**Release Summary:** Releases occurred as follows: (1) seepage from the crater from 1530 hours on March 31, 1984, to 1900 hours on April 1, 1984; (2) a controlled, filtered release on June 13, 1984; and (3) a ventilation line release at 0705 hours on April 5, 1984, during postshot drilling operations.

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**References:** (E) (H) (I) (X) (AO) (CS) (OG) (OO) (SD)

---

**Test: ORKNEY**

<b>Date:</b>	05/02/84	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0650 PDT	<b>Depth of Burial:</b>	689 ft
<b>Location:</b>	NTS U10be	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $5.3 \times 10^{-1}$**  $^{133}\text{Xe}$  in curies:  $4.1 \times 10^{-1}$  $^{133\text{m}}\text{Xe}$  in curies:  $1.7 \times 10^{-2}$  $^{135}\text{Xe}$  in curies:  $9.8 \times 10^{-2}$ 

---

**Release Summary:** A release occurred from the ventilation line at 0927 hours on May 5, 1984.**References:** (H) (AO) (Q0) (Q1)

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**Test: CAPROCK**

<b>Date:</b>	05/31/84	<b>Sponsor:</b>	LANL
<b>Time:</b>	0604 PDT	<b>Depth of Burial:</b>	1,969 ft
<b>Location:</b>	NTS U4q	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:  $5.5 \times 10^{-2}$  (Accidental)** $^3\text{H}$  in curies:  $4.2 \times 10^{-2}$  $^{85}\text{Kr}$  in curies:  $3.6 \times 10^{-4}$  $^{37}\text{Ar}$  in curies:  $1.3 \times 10^{-2}$  $^{133}\text{Xe}$  in curies:  $3.5 \times 10^{-5}$ 

---

**Gas Sampling Release Activity at Time of Release, in Curies:  $6.7 \times 10^{-3}$  (Controlled)** $^3\text{H}$  in curies:  $6.1 \times 10^{-3}$  $^{85}\text{Kr}$  in curies:  $6.1 \times 10^{-4}$ 

---

**Release Summary:** LLNL performed a gas sampling operations on January 15, 1985, from which there was an accidental release and on March 5, 1985, from which there was a controlled release from the gas sampling containment tank.

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References: (E) (H) (X) (AO) (T4)

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<b>Test:</b>	<b>KAPPELI</b>		
<b>Date:</b>	07/25/84	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0830 PDT	<b>Depth of Burial:</b>	2,100 ft
<b>Location:</b>	NTS U20am	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Late-Time Seepage

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**Natural, Late-Time Seepage at Time of Release, in Curies:**  $1.2 \times 10^1$

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**Isotopes Detected in the Release:**  $^{85}\text{Kr}$

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**Release Summary:** Seepage began months after the test and continued as follows:

9/24/84 - 12/31/84 0.5 curies of  $^{85}\text{Kr}$

11/25/84 - 7/25/85 3.6 curies of  $^{85}\text{Kr}$

7/25/85 - 7/25/86 5.0 curies of  $^{85}\text{Kr}$

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References: (E) (H) (I) (X) (AO) (CU)

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<b>Test:</b>	<b>BRETON</b>		
<b>Date:</b>	09/13/84	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,585 ft
<b>Location:</b>	NTS U4ar	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.5 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $9.6 \times 10^{-3}$

$^{133\text{m}}\text{Xe}$  in curies:  $4.2 \times 10^{-4}$

$^{135}\text{Xe}$  in curies:  $5.2 \times 10^{-3}$

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**Gas Sampling Release Activity at Time of Release in Curies:** 3.7 (Controlled)

$^{133}\text{Xe}$  in curies:  $2.2 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $1.1 \times 10^{-2}$

$^3\text{H}$  in curies: 3.5

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.6 \times 10^{-1}$  (Accidental)

$^{131m}\text{Xe}$  in curies:  $7.5 \times 10^{-5}$

$^{133}\text{Xe}$  in curies:  $9.7 \times 10^{-5}$

$^{85}\text{Kr}$  in curies:  $1.0 \times 10^{-3}$

$^3\text{H}$  in curies:  $1.2 \times 10^{-1}$

$^{37}\text{Ar}$  in curies:  $3.5 \times 10^{-2}$

---

**Release Summary:** Releases occurred as follows: (1) a drillback release of 0.015 curies of xenon isotopes from the ventilation line on September 15, 1984, at 1834 hours, lasting for 4 minutes; (2) three controlled gas sampling releases totalling 3.7 curies of xenon isotopes and tritium at: a) 0939 hours on September 20, 1984, lasting for 53 minutes; b) 0917 hours on September 24, 1984, lasting for 93 minutes; and c) 1043 hours on October 9, 1984, lasting for 51 minutes; and (3) an accidental release on January 15, 1985, from a break in the gas sampling hose (not during a gas sampling operation).

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**References:** (E) (H) (I) (X) (AO) (CV) (CW) (OH) (SS)

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**Test:** **TIERRA**

**Date:** 12/15/84

**Sponsor:** LLNL

**Time:** 0645 PST

**Depth of Burial:** 2,100 ft

**Location:** NTS U19ac

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** 20 to 150 kt

**Release**

**Detected:** Onsite Only

**Type of**

**Release:** Late-Time Seepage

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**Natural, Late-Time Seepage at Time of Release, in Curies:**  $6.0 \times 10^2$

$^{133}\text{Xe}$  in curies:  $5.7 \times 10^2$

$^{131m}\text{Xe}$  in curies: 4.0

$^{85}\text{Kr}$  in curies:  $1.2 \times 10^1$

$^{37}\text{Ar}$  in curies: 9.0

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**Release Summary:** Seepage occurred intermittently from December 26, 1984, to January 4, 1986.

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**References:** (E) (H) (X) (AP) (CX) (SE)

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**Test: VAUGHN**

<b>Date:</b>	03/15/85	<b>Sponsor:</b>	LANL
<b>Time:</b>	0831 PST	<b>Depth of Burial:</b>	1,401 ft
<b>Location:</b>	NTS U3lr	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^2$

$^{133}\text{Xe}$  and  $^{135}\text{Xe}$  in curies:  $1.0 \times 10^2$

iodines in curies:  $6.0 \times 10^{-3}$

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**Release Summary:** A release occurred during installation of gas sampling tubing.

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**References:** (E) (H) (AP) (SF)

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**Test: MISTY RAIN**

<b>Date:</b>	04/06/85	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	1515 PST	<b>Depth of Burial:</b>	1,276 ft
<b>Location:</b>	NTS U12n.17	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Controlled

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**Controlled Release Activity at Time of Release, in Curies:**  $6.3 \times 10^1$

**Controlled Release Activity at R+12 Hours, in Curies:**  $4.5 \times 10^1$

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**Isotopes Detected in Release:**  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ , and  $^{135}\text{Xe}$

**Maximum Activity Detected in Air Offsite:**  $47 \pm 10$  picocuries of  $^{133}\text{Xe}$  per cubic meter of air at Reed Ranch Road, Nevada (unpopulated);  $11 \pm 5$  picocuries of  $^{133}\text{Xe}$  per cubic meter of air at Rachel, Nevada (populated)

**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were detected.

**Maximum Iodine Level Detected Offsite:** No iodines were detected.

**Maximum Distance Radiation Detected Offsite:** No radiation intensities above background levels were detected.

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**Release Summary:** Controlled ventilation occurred from H+2.85 days until H+4 days. Prior to that time, the activity had been contained inside the gas seal plug until ventilation could be reestablished. The release points were the N Tunnel portal and the N Tunnel mesa ventilation lines. The effluent was 72%  $^{133}\text{Xe}$ , 22%  $^{135}\text{Xe}$ , and 6%  $^{133\text{m}}\text{Xe}$ .

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**References:** (E) (H) (W) (AP) (DV) (SG)

<b>Test:</b>	<b>SALUT</b>		
<b>Date:</b>	06/12/85	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0815 PDT	<b>Depth of Burial:</b>	1,995 ft
<b>Location:</b>	NTS U20ak	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

**Drillback Release Activity at Time of Release, in Curies: 3.1**

$^{133}\text{Xe}$  in curies: 3.0  
 $^{133\text{m}}\text{Xe}$  in curies:  $6.0 \times 10^{-2}$   
 $^{135}\text{Xe}$  in curies:  $2.2 \times 10^{-2}$

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**Gas Sampling Release Activity at Time of Release, in Curies:  $7.8 \times 10^{-1}$**

$^3\text{H}$  in curies:  $5.5 \times 10^{-4}$   
 $^{85}\text{Kr}$  in curies:  $2.5 \times 10^{-2}$   
 $^{127}\text{Xe}$  in curies:  $1.2 \times 10^{-4}$   
 $^{133}\text{Xe}$  in curies:  $2.6 \times 10^{-1}$   
 $^{133\text{m}}\text{Xe}$  in curies:  $4.9 \times 10^{-1}$   
 $^{131}\text{I}$  in curies:  $1.1 \times 10^{-4}$   
tritiated water:  $5.3 \times 10^{-5}$

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**Release Summary:** Four drillback releases occurred from the postshot ventilation line as follows: (1) at 1802 hours on June 19, 1985, lasting for 3.9 minutes; (2) at 2226 hours on June 19, 1985, lasting for 13 minutes; (3) at 1915 hours on June 20, 1985, lasting for 36.6 minutes and; (4) at 2110 hours on June 20, 1985, lasting for 10.3 minutes.

A controlled gas sampling containment tank release occurred on August 6, 1985.

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**References:** (E) (H) (X) (AP) (C0) (SH)

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<b>Test:</b>	<b>VILLE</b>		
<b>Date:</b>	06/12/85	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1030 PDT	<b>Depth of Burial:</b>	961 ft
<b>Location:</b>	NTS U4am	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

**Drillback Release Activity at Time of Release, in Curies:**  $9.7 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $7.0 \times 10^{-2}$

$^{133\text{m}}\text{Xe}$  in curies:  $3.0 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $2.4 \times 10^{-2}$

**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.1 \times 10^{-3}$

$^3\text{H}$  in curies:  $1.0 \times 10^{-3}$

$^{85}\text{Kr}$  in curies:  $1.1 \times 10^{-4}$

**Release Summary:** A drillback release occurred from the postshot ventilation line on June 15, 1985.

A controlled gas sampling containment tank release occurred on August 6, 1986.

**References:** (E) (H) (X) (AP) (SI)

<b>Test:</b>	<b>MARIBO</b>		
<b>Date:</b>	06/26/85	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1103 PDT	<b>Depth of Burial:</b>	1,250 ft
<b>Location:</b>	NTS U2cs	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:** 4.2

$^{133}\text{Xe}$  in curies: 3.1

$^{133\text{m}}\text{Xe}$  in curies:  $1.5 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $9.2 \times 10^{-1}$

**Release Summary:** Drillback releases occurred from the postshot ventilation line at 1145 hours on June 28, 1985, lasting for 4.5 minutes, and at 0107 hours on June 29, 1985, lasting for 52 minutes.

**References:** (E) (H) (X) (AP) (SJ)

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<b>Test:</b>	<b>SERENA</b>		
<b>Date:</b>	07/25/85	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0700 PDT	<b>Depth of Burial:</b>	1,959 ft
<b>Location:</b>	NTS U20an	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:** 2.9

$^{133}\text{Xe}$  in curies: 2.7

$^{133\text{m}}\text{Xe}$  in curies:  $1.0 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $8.0 \times 10^{-2}$

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**Release Summary:** Eight drillback releases occurred from the postshot ventilation line as follows: (1) at 2148 hours on July 28, 1985, lasting for one minute; (2) at 1705 hours on August 1, 1985, lasting for one minute; (3) at 1727 hours on August 1, 1985, lasting for one minute; (4) at 1301 hours on August 3, 1985, lasting for one minute; (5) at 0920 hours on August 4, 1985, lasting for one minute; (6) at 0325 hours on August 6, 1985, lasting for 43 minutes; (7) at 1325 hours on August 6, 1985, lasting for 3.5 minutes; and (8) at 1341 hours on August 6, 1985, lasting for 1.5 minutes.

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**References:** (E) (H) (X) (AP) (SK)

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<b>Test:</b>	<b>CEBRERO</b>		
<b>Date:</b>	08/14/85	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	600 ft
<b>Location:</b>	NTS U9cw	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $4.3 \times 10^{-4}$

$^3\text{H}$  in curies:  $4.0 \times 10^{-4}$

$^{85}\text{Kr}$  in curies:  $3.2 \times 10^{-5}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on August 6, 1986.

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**References:** (E) (H) (X) (AP) (C0)

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**Test: MILL YARD**

<b>Date:</b>	10/09/85	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	1340 PDT	<b>Depth of Burial:</b>	1,230 ft
<b>Location:</b>	NTS U12n.20	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at Time of Release, in Curies: 5.9****Controlled Release Activity at R+12 Hours, in Curies: 4.6****Isotopes Detected in Release:**  $^{133}\text{Xe}$ ,  $^{135}\text{Xe}$ , and  $^{135\text{m}}\text{Xe}$ **Release Summary:** Controlled ventilations occurred as follows:

1. Controlled ventilation from the working point side of the U12n.20 drift was conducted from H+1.9 days until H+2.5 days. The effluent was 80%  $^{135}\text{Xe}$ , 18%  $^{133}\text{Xe}$ , and 2%  $^{135\text{m}}\text{Xe}$ .
2. A controlled release occurred during ventilation of the MILL YARD cavity from H+16 days until H+18 days. The effluent was 98%  $^{133}\text{Xe}$  and 2%  $^{135\text{m}}\text{Xe}$ .

**References:** (E) (H) (W) (AQ) (SL)**Test: DIAMOND BEECH**

<b>Date:</b>	10/09/85	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	1620 PDT	<b>Depth of Burial:</b>	1,325 ft
<b>Location:</b>	NTS U12n.19	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at Time of Release, in Curies: 1.1****Controlled Release Activity at R+12 Hours, in Curies: 1.0****Isotopes Detected in Release:**  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ , and  $^{135}\text{Xe}$ **Release Summary:** Controlled ventilations occurred as follows:

1. Ventilation of the tunnel to the portal side of the U12n.19 DPP occurred from H+1.8 days until H+2.5 days. The effluent was 80%  $^{135}\text{Xe}$ , 11%  $^{133\text{m}}\text{Xe}$ , and 9%  $^{133}\text{Xe}$ .
2. Ventilation of the U12n.19 main drift occurred from H+8 days until H+9 days. The effluent was 82%  $^{133}\text{Xe}$  and 18%  $^{133\text{m}}\text{Xe}$ .

References: (E) (H) (W) (AQ) (SL)

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<b>Test:</b>	<b>ROQUEFORT</b>		
<b>Date:</b>	10/16/85	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1435 PDT	<b>Depth of Burial:</b>	1,362 ft
<b>Location:</b>	NTS U4as	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $2.7 \times 10^{-2}$

$^3\text{H}$ in curies:	$2.4 \times 10^{-2}$
$^{85}\text{Kr}$ in curies:	$3.4 \times 10^{-3}$
$^{127}\text{Xe}$ in curies:	$2.1 \times 10^{-5}$
$^{131}\text{I}$ in curies:	$5.6 \times 10^{-7}$
tritiated water in curies:	$2.6 \times 10^{-5}$

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**Release Summary:** A controlled gas sampling containment tank release occurred on August 6, 1986.

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References: (E) (H) (X) (AQ) (C0)

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<b>Test:</b>	<b>ABO</b>		
<b>Date:</b>	10/30/85	<b>Sponsor:</b>	LANL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	644 ft
<b>Location:</b>	NTS U3mc	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $6.0 - 3.0 \times 10^1$

iodines in curies:	$3.0 \times 10^{-2} - 1.4 \times 10^{-1}$
xenons in curies:	$6.0 - 3.0 \times 10^1$

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**Release Summary:** A release occurred from the mud line between 1900 and 2000 hours on October 31, 1965.

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References: (E) (H) (AQ) (Q2) (QI) (TD)

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**Test: GLENCOE**

<b>Date:</b>	03/22/86	<b>Sponsor:</b>	LANL
<b>Time:</b>	0815 PST	<b>Depth of Burial:</b>	2,000 ft
<b>Location:</b>	NTS U4i	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	29 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Drillback

**Drillback Release Activity at Time of Release, in Curies:**  $7.4 \times 10^{-2}$  $^{133}\text{Xe}$  in curies:  $7.4 \times 10^{-2}$  $^{135}\text{Xe}$  in curies:  $8.9 \times 10^{-6}$  $^{131}\text{I}$  in curies:  $8.9 \times 10^{-6}$  $^{133}\text{I}$  in curies:  $9.6 \times 10^{-6}$ **Maximum Distance Radiation Detected Offsite:** Eighty-four picocuries of  $^{133}\text{Xe}$  per cubic meter of air were measured on a gas sampler at Lathrop Wells, Nevada.**Release Summary:** A release occurred during a sampling operation on March 27, 1989.**References:** (E) (H) (U) (AQ) (HZ) (SM) (SV)**Test: MIGHTY OAK**

<b>Date:</b>	04/10/86	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	0608 PST	<b>Depth of Burial:</b>	1,294 ft
<b>Location:</b>	NTS U12t.08	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Offsite	<b>Type of Release:</b>	Controlled

**Controlled Release Activity at Time of Release, in Curies:**  $3.6 \times 10^4$ **Controlled Release Activity at R+12 Hours, in Curies:**  $3.3 \times 10^4$ **Isotopes Detected in Release:**  $^{85}\text{Kr}$ ,  $^{131}\text{I}$ , and  $^{133}\text{Xe}$ \***Maximum Activity Detected in Air Offsite:**  $430 \pm 15$  picocuries of  $^{133}\text{Xe}$  per cubic meter of air at Medlins Ranch, Nevada**Maximum Gamma Exposure Rate Detected Offsite:** No radiation intensities above background levels were detected.**Maximum Iodine Level Detected Offsite:** 4.6 picocuries of  $^{131}\text{I}$  per cubic meter of air at Twin Springs Ranch, Nevada\*\*

**Maximum Distance Radiation Detected Offsite:** No radiation intensities above background were detected.

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**Release Summary:** Eight controlled ventilations occurred as follows:

1. Controlled ventilation from the gas seal plug (GSP) to the DPP was performed from 0950 hours on April 22 to 0611 hours on April 23, 1986. At the time of release, 340 curies of activity were released (calculated to be 316 curies at R+12).\*\*\*
2. Controlled ventilation of the tunnel complex, work point side of the DPP, was performed from 1040 hours to 1440 hours on April 25. At the time of release, 3,400 curies were released (calculated to be 3,200 curies at R+12).\*\*\*
3. Controlled ventilation of the tunnel complex occurred from 1002 hours on April 28 to 0310 hours on April 29. At the time of release, 9,800 curies were released (calculated to be 9,100 curies at R+12).\*\*\*
4. Controlled ventilation of the tunnel complex occurred from 1034 hours to 1504 hours on April 29. At the time of release, 1,800 curies were released (calculated to be 1,700 curies at R+12).\*\*\*
5. Controlled ventilation of the tunnel complex occurred from 1422 hours to 1805 hours on April 30. At the time of release, 1,200 curies were released (calculated to be 1,100 curies at R+12).\*\*\*
6. Controlled ventilation of the tunnel complex occurred from 1011 hours to 1937 hours on May 1, 1986. At the time of release, 4,900 curies were released (calculated to be 4,600 curies at R+12).\*\*\*
7. Controlled ventilation of the tunnel complex occurred from 0946 hours on May 2 to 0450 hours on May 4. At the time of release, 9,000 curies were released (calculated to be 8,400 curies at R+12).\*\*\*
8. Controlled ventilation of the tunnel complex occurred from 1350 hours on May 5 to 1050 hours on May 19. At the time of release, 5,500 curies were released (calculated to be 5,100 curies at R+12).\*\*\*

The total release, at the time of release, was 36,000 curies; at R+12, the total activity was calculated to be 33,000 curies.

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**References:** (E) (H) (K) (T) (U) (AQ) (CA) (DT)

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\*The total release associated with MIGHTY OAK was assumed to be all  $^{133}\text{Xe}$ , but during the ventilation period, 2.4 curies of  $^{131}\text{I}$  and 4.3 curies of  $^{85}\text{Kr}$  were also released.

\*\*Attributed to the Chernobyl nuclear accident in the Soviet Union and not to this test.

\*\*\*All ventilations of the tunnel were accomplished with the approval of the Test Controller.

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**Test: JEFFERSON**

<b>Date:</b>	04/22/86	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0630 PST	<b>Depth of Burial:</b>	1,998 ft
<b>Location:</b>	NTS U20ai	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $1.4 \times 10^{-2}$**  $^{133}\text{Xe}$  in curies:  $1.4 \times 10^{-2}$  $^{133\text{m}}\text{Xe}$  in curies:  $3.6 \times 10^{-4}$  $^{135}\text{Xe}$  in curies:  $1.6 \times 10^{-5}$ 

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**Release Summary:** A release occurred through the ventilation line on April 28, 1986, at 1310 hours lasting for six minutes, as the drill string was being removed from the hole.

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**References:** (E) (H) (X) (AQ) (OI) (SN)

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**Test: PANAMINT**

<b>Date:</b>	05/21/86	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0659 PDT	<b>Depth of Burial:</b>	1,575 ft
<b>Location:</b>	NTS U2gb	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

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**Drillback Release Activity at Time of Release, in Curies: 3.3** $^{133}\text{Xe}$  in curies: 1.2 $^{133\text{m}}\text{Xe}$  in curies:  $6.0 \times 10^{-3}$  $^{135}\text{Xe}$  in curies: 2.1 $^{131}\text{I}$  in curies:  $1.0 \times 10^{-4}$  $^{133}\text{I}$  in curies:  $9.0 \times 10^{-4}$ 

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**Gas Sampling Release Activity at Time of Release, in Curies:  $1.5 \times 10^{-1}$**  $^3\text{H}$  in curies:  $1.5 \times 10^{-1}$  $^{85}\text{Kr}$  in curies:  $2.5 \times 10^{-4}$ 

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**Release Summary:** Releases occurred through the Regan head and the ventilation line during postshot drilling operations at 1358 hours on May 23, 1986, lasting for 3.7 minutes.

A gas sampling experiment was performed on June 26, 1987, from which a controlled release occurred.

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**References:** (E) (H) (X) (AQ) (OJ) (SO) (TF)

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**Test:** **CYBAR**

<b>Date:</b>	07/17/86	<b>Sponsor:</b>	LANL
<b>Time:</b>	1400 PDT	<b>Depth of Burial:</b>	2,060 ft
<b>Location:</b>	NTS U19ar	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	119 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

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**Cementback Release Activity at Time of Release, in Curies:**  $3.0 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $3.0 \times 10^{-3}$

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**Release Summary:** A release occurred on August 14, 1986.

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**References:** (E) (H) (AQ) (SP) (SV)

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**Test:** **CORNUCOPIA**

<b>Date:</b>	07/24/86	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0805 PDT	<b>Depth of Burial:</b>	1,250 ft
<b>Location:</b>	NTS U2gaS	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $1.1 \times 10^{-2}$

$^3\text{H}$  in curies:  $9.9 \times 10^{-3}$

$^{85}\text{Kr}$  in curies:  $6.6 \times 10^{-4}$

---

**Release Summary:** A controlled release occurred during a gas sampling operation conducted on June 26, 1987.

---

**References:** (E) (H) (X) (AQ) (TG)

---

**Test: LABQUARK**

<b>Date:</b>	09/30/86	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1530 PDT	<b>Depth of Burial:</b>	2,020 ft
<b>Location:</b>	NTS U19an	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Late-Time Seepage

---

**Natural, Late-Time Seepage Activity at Time of Release, in Curies:**  $1.6 \times 10^1$

$^{133}\text{Xe}$  in curies: 2.6

$^{85}\text{Kr}$  in curies:  $1.3 \times 10^1$

---

**Release Summary:** Two late-time releases, due to seepage, occurred from October 25, 1986 to January 13, 1987.

---

**References:** (E) (H) (X) (AQ) (T5)

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**Test: BELMONT**

<b>Date:</b>	10/16/86	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1200 PDT	<b>Depth of Burial:</b>	1,985 ft
<b>Location:</b>	NTS U20as	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:**  $1.5 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $1.5 \times 10^{-1}$

$^{133\text{m}}\text{Xe}$  in curies:  $3.4 \times 10^{-3}$

$^{135}\text{Xe}$  in curies:  $8.0 \times 10^{-5}$

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $6.4 \times 10^{-2}$

$^3\text{H}$  in curies:  $4.8 \times 10^{-2}$

$^{85}\text{Kr}$  in curies:  $1.6 \times 10^{-2}$

---

**Release Summary:** A release through the ventilation line during drillback operations occurred at 0555 hours on October 23, 1986, and lasted for four minutes.

A gas sampling experiment was performed on July 14, 1987, from which a controlled release occurred.

---

**References:** (E) (H) (X) (BA) (OK) (SQ) (TH)

---

**Test: GASCON**

<b>Date:</b>	11/14/86	<b>Sponsor:</b>	LANL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	1,949 ft
<b>Location:</b>	NTS U4t	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:  $7.3 \times 10^{-3}$** 

$^3\text{H}$ in curies:	$6.7 \times 10^{-3}$
$^{85}\text{Kr}$ in curies:	$6.3 \times 10^{-4}$
$^{127}\text{Xe}$ in curies:	$2.9 \times 10^{-5}$

---

**Release Summary:** LLNL performed a gas sampling experiment in June 1987 from which there was a controlled release.

---

**References:** (E) (H) (X) (BA) (TI)

---

**Test: BODIE**

<b>Date:</b>	12/13/86	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0950 PST	<b>Depth of Burial:</b>	2,083 ft
<b>Location:</b>	NTS U20ap	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Late-Time Seepage

---

**Drillback Release Activity at Time of Release, in Curies: 1.2**

$^{133}\text{Xe}$ in curies:	1.2
$^{133\text{m}}\text{Xe}$ in curies:	$4.8 \times 10^{-2}$
$^{135}\text{Xe}$ in curies:	$9.8 \times 10^{-4}$

---

**Natural, Late-Time Seepage Activity at Time of Release, in Curies:  $5.0 \times 10^1$** 

$^{133}\text{Xe}$ in curies:	$4.4 \times 10^1$
$^{133\text{m}}\text{Xe}$ in curies:	2.0
$^{131\text{m}}\text{Xe}$ in curies:	1.0
$^{85}\text{Kr}$ in curies:	2.0
$^{37}\text{Ar}$ in curies:	1.0

---

**Release Summary:** Five drillback releases occurred from the ventilation line from 2307 hours on December 20, 1986, until 0215 hours on December 21, 1986, for a total release time of 24.3 minutes. Seepage occurred continuously from December 15, 1986, to January 20, 1987, and sporadically, depending on the atmospheric pressure, until December 16, 1987.

---

**References:** (E) (H) (X) (BA) (OL) (OM) (SR) (TJ)

---

**Detonations:** **HAZEBROOK, -EMERALD (GREEN)\*, -CHECKERBERRY (RED)\*, -APRICOT (ORANGE)\*\***  
(simultaneous, same hole)

<b>Date:</b>	02/03/87	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0720 PST	<b>Depth of Burial:</b>	610 ft, 742 ft, 860 ft
<b>Location:</b>	NTS U10bh	<b>Purpose:</b>	Weapons Related* Safety Experiment**
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $2.4 \times 10^{-3}$

$^3\text{H}$ in curies:	$2.3 \times 10^{-3}$
$^{85}\text{Kr}$ in curies:	$1.0 \times 10^{-4}$
$^{137}\text{Cs}$ in curies:	$8.2 \times 10^{-6}$

---

**Release Summary:** LLNL performed a gas sampling experiment on June 26, 1987, from which there was a controlled release from the containment tank.

---

**References:** (E) (H) (X) (BA) (TK)

---

**Test:** **HARDIN**

<b>Date:</b>	04/30/87	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0630 PDT	<b>Depth of Burial:</b>	2,051 ft
<b>Location:</b>	NTS U20av	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $2.1 \times 10^{-1}$

$^3\text{H}$ in curies:	$1.9 \times 10^{-1}$
$^{85}\text{Kr}$ in curies:	$2.4 \times 10^{-2}$
$^{137}\text{Cs}$ in curies:	$8.9 \times 10^{-6}$

---

**Release Summary:** A controlled release occurred during gas sampling operations on November 9, 1987.

---

**References:** (E) (H) (X) (BA) (TL)

---

**Test: MISSION GHOST**

<b>Date:</b>	06/20/87	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	1,054 ft
<b>Location:</b>	NTS U12t.09	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

---

**Controlled Release at Time of Release, in Curies:** 3.0

<sup>85</sup>Kr in curies: 3.0

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**Release Summary:** The activity was contained within the cavity until ventilation was established on December 16, 1987. The release continued intermittently for approximately three weeks.

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**References:** (E) (H) (K) (BA) (CB) (TM)

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**Test: PANCHUELA**

<b>Date:</b>	06/30/87	<b>Sponsor:</b>	LANL
<b>Time:</b>	0905 PDT	<b>Depth of Burial:</b>	1,050 ft
<b>Location:</b>	NTS U3mg	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 5.0 - 1.0 x 10<sup>2</sup>

xenons in curies: 5.0 - 1.0 x 10<sup>2</sup>

iodines in curies: 5.0 x 10<sup>-2</sup> - 3.0 x 10<sup>-1</sup>

---

**Release Summary:** A drillback release occurred between 0600 and 1235 hours on July 3, 1987.

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**References:** (E) (H) (Y) (BA) (OP) (OR) (TN) (TO)

---

**Test: LOCKNEY**

<b>Date:</b>	09/24/87	<b>Sponsor:</b>	LANL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	2,020 ft
<b>Location:</b>	NTS U19aq	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 4.0**

xenons in curies: 4.0

iodines in curies:  $1.0 \times 10^{-3}$ 

---

**Release Summary:** A drillback release occurred between 1900 and 2000 hours on October 6, 1987.

---

**References:** (E) (H) (Y) (BA) (OP) (OS) (TN) (TP)

---

**Test: BORATE**

<b>Date:</b>	10/23/87	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0900 PDT	<b>Depth of Burial:</b>	1,780 ft
<b>Location:</b>	NTS U2ge	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:  $2.4 \times 10^{-2}$**  $^{133}\text{Xe}$  in curies:  $1.9 \times 10^{-2}$  $^{133\text{m}}\text{Xe}$  in curies:  $7.8 \times 10^{-4}$  $^{135}\text{Xe}$  in curies:  $4.6 \times 10^{-3}$ 

---

**Release Summary:** A drillback release occurred through the ventilation line filter system at 1126 hours on October 26, 1987, and lasted for 2.8 minutes.

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**References:** (E) (H) (X) (BB) (ON) (OT) (TQ)

**Test: SCHELLBOURNE**

<b>Date:</b>	05/13/88	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0835 PDT	<b>Depth of Burial:</b>	1,520 ft
<b>Location:</b>	NTS U2gf	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:  $2.2 \times 10^1$** 

$^{133}\text{Xe}$ in curies:	$1.4 \times 10^1$
$^{133\text{m}}\text{Xe}$ in curies:	$2.0 \times 10^{-1}$
$^{135}\text{Xe}$ in curies:	7.3
$^{131}\text{I}$ in curies:	$3.2 \times 10^{-5}$
$^{133}\text{I}$ in curies:	$1.1 \times 10^{-4}$

---

**Gas Sampling Release Activity at Time of Release, in Curies:  $1.1 \times 10^{-1}$** 

$^{137}\text{Cs}$ in curies:	$7.3 \times 10^{-6}$
$^{85}\text{Kr}$ in curies:	$1.8 \times 10^{-2}$
$^3\text{H}$ in curies:	$8.7 \times 10^{-2}$

---

**Release Summary:** Several intermittent drillback releases occurred from the ventilation line beginning at 1728 hours on May 15, 1988, until 1206 hours on May 20, 1988. A release from the drilling platform occurred on May 15, 1988.

A gas sampling operation was performed on July 13, 1989, from which there was a controlled release from the containment tank.

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**References:** (E) (H) (X) (BB) (OU) (T1) (TR) (VJ)

---

**Test: COMSTOCK**

<b>Date:</b>	06/02/88	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0600 PDT	<b>Depth of Burial:</b>	2,035 ft
<b>Location:</b>	NTS U20ay	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

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**Gas Sampling Release Activity at Time of Release, in Curies:**  $4.3 \times 10^{-3}$  $^{85}\text{Kr}$  in curies:  $3.3 \times 10^{-4}$  $^3\text{H}$  in curies:  $4.0 \times 10^{-3}$ 

---

**Release Summary:** A gas sampling operation was performed on July 12, 1989, from which there was a controlled release from the containment tank.

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**References:** (E) (H) (X) (BB) (T1)

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<b>Test:</b>	<b>BULLFROG</b>		
<b>Date:</b>	08/30/88	<b>Sponsor:</b>	LLNL
<b>Time:</b>	1100 PDT	<b>Depth of Burial:</b>	1,605 ft
<b>Location:</b>	NTS U4au	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Gas Sampling

---

**Drillback Release Activity at Time of Release, in Curies:** 4.4 $^{133}\text{Xe}$  in curies: 4.1 $^{133\text{m}}\text{Xe}$  in curies:  $2.6 \times 10^{-1}$  $^{135}\text{Xe}$  in curies:  $7.3 \times 10^{-2}$ 

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $3.6 \times 10^{-2}$  $^{85}\text{Kr}$  in curies:  $9.0 \times 10^{-3}$  $^3\text{H}$  in curies:  $2.7 \times 10^{-2}$ 

---

**Release Summary:** Seven intermittent drillback releases occurred from the ventilation line beginning at 1027 hours on September 3, 1988, until 2304 hours on September 4, 1988, lasting for 36 minutes.

A gas sampling operation was performed on July 13, 1989, from which there was a controlled release.

---

**References:** (E) (H) (X) (BB) (OV) (T1) (TR) (VK)

---

**Test: MISTY ECHO**

<b>Date:</b>	12/10/88	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	1230 PST	<b>Depth of Burial:</b>	1,313 ft
<b>Location:</b>	NTS U12n.23	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

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**Gas Sampling Release Activity at Time of Release, in Curies: 6.7**

$^{127}\text{Xe}$ in curies:	$5.8 \times 10^{-6}$
$^{129\text{m}}\text{Xe}$ in curies:	$7.5 \times 10^{-5}$
$^{131\text{m}}\text{Xe}$ in curies:	$3.4 \times 10^{-2}$
$^{133}\text{Xe}$ in curies:	$3.4 \times 10^{-1}$
$^{85}\text{Kr}$ in curies:	$1.2 \times 10^{-1}$
$^3\text{H}$ in curies:	$3.4 \times 10^{-2}$
$^{37}\text{Ar}$ in curies:	6.2
$^{39}\text{Ar}$ in curies:	$2.7 \times 10^{-3}$

---

**Release Summary:** Effluent was released during an experimental gas diagnostics program that started on January 26, 1989, and continued intermittently until April 19, 1989. The effluent was filtered before being released into the tunnel ventilation system.

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**References:** (E) (H) (K) (BC) (CD) (T0)

---

**Detonations: KAWICH-RED, -BLACK (simultaneous, same hole)**

<b>Date:</b>	02/24/89	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0815 PST	<b>Depth of Burial:</b>	1,214 ft, 1,414 ft
<b>Location:</b>	NTS U2cu	<b>Purpose:</b>	Weapons Related (-RED) Safety Experiment (-BLACK)
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies: 9.8**

$^{133}\text{Xe}$ in curies:	7.0
$^{133\text{m}}\text{Xe}$ in curies:	$3.0 \times 10^{-1}$
$^{135}\text{Xe}$ in curies:	2.5

---

**Release Summary:** Nineteen intermittent drillback releases occurred from the vent line beginning on February 26, 1989, and lasting through March 1, 1989, with a total release time of 6.9 hours.

---

**References:** (E) (H) (X) (BC) (CY) (T1)

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**Detonations:** **PALISADE-1, -2, -3** (simultaneous, same hole)

<b>Date:</b>	05/15/89	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0610 PDT	<b>Depth of Burial:</b>	1,132 ft, 1,286 ft, 1,326 ft
<b>Location:</b>	NTS U4at	<b>Purpose:</b>	Weapons Related (-1) Safety Experiment (-2 and -3)
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt (each)
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

---

**Gas Sampling Release Activity at Time of Release, in Curies:** 2.4

$^{133}\text{Xe}$  in curies: 1.0

$^{135}\text{Xe}$  in curies: 1.4

---

**Release Summary:** A gas sampling operation release occurred from the drilling platform at 1327 hours on May 17, 1989, and lasted for 36 minutes.

---

**References:** (E) (H) (X) (BC) (T1) (T2)

---

**Test:** **DISKO ELM**

<b>Date:</b>	09/14/89	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	857 ft
<b>Location:</b>	NTS U12p.03	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled and Gas Sampling

---

**Controlled Release Activity at Time of Release, in Curies:**  $4.8 \times 10^{-1}$ \*

**Controlled Release Activity at R+12 Hours, in Curies:**  $4.2 \times 10^{-1}$

---

**Isotopes Identified in the Release:**  $^{85}\text{Kr}$ ,  $^{131\text{m}}\text{Xe}$ ,  $^{133}\text{Xe}$ ,  $^{133\text{m}}\text{Xe}$ , and  $^{135}\text{Xe}$

---

**Gas Sampling Release Activity at Time of Release, in Curies:**  $4.7 \times 10^1$

$^{127}\text{Xe}$  in curies:  $3.2 \times 10^{-5}$

$^{129\text{m}}\text{Xe}$  in curies:  $2.1 \times 10^{-3}$

$^{131\text{m}}\text{Xe}$  in curies:  $2.3 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $3.7 \times 10^1$   
 $^{133\text{m}}\text{Xe}$  in curies:  $6.2 \times 10^{-1}$   
 $^{37}\text{Ar}$  in curies: 8.9  
 $^{39}\text{Ar}$  in curies:  $1.5 \times 10^{-3}$   
 $^{85}\text{Kr}$  in curies:  $2.8 \times 10^{-2}$

---

**Release Summary:** Controlled releases occurred as follows: (1) on September 18-19, 1989, from 0950 to 1000 hours from the LOS drift when effluent was filtered before being released to the environment; (2) on October 23, 1989, and January 10, 1990, when various sections of the LOS pipe were purged into the tunnel ventilation system; and (3)\*\* during an experimental gas diagnostics program, on an intermittent basis, from September 25 to December 12, 1989.

In addition, small amounts of effluent  $^{85}\text{Kr}$  were released during reentry mining operations between March 27, and April 17, 1990. These releases did not add significantly to the total release of radioactivity associated with the DISKO ELM test.

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**References:** (E) (H) (K) (BC) (CE) (CF) (T0)

\*Totals include both filtered and unfiltered releases.

\*\*These releases were unfiltered, but controlled. Experience gained from the MISTY ECHO experimental gas diagnostics program indicated that only noble gases would be released.

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<b>Test:</b>	<b>BARNWELL</b>		
<b>Date:</b>	12/08/89	<b>Sponsor:</b>	LLNL/UK
<b>Time:</b>	0700 PST	<b>Depth of Burial:</b>	1,971 ft
<b>Location:</b>	NTS U20az	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback and Late-Time Seepage

---

**Drillback Release Activity at Time of Release, in Curies:**  $5.7 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $5.6 \times 10^{-2}$   
 $^{133\text{m}}\text{Xe}$  in curies:  $1.4 \times 10^{-3}$   
 $^{135}\text{Xe}$  in curies:  $6.0 \times 10^{-5}$

---

**Natural, Late-Time Seepage Activity at Time of Release, in Curies:**  $4.7 \times 10^1$

$^{131\text{m}}\text{Xe}$  in curies: 1.2  
 $^{133}\text{Xe}$  in curies:  $4.1 \times 10^1$

$^{133\text{m}}\text{Xe}$  in curies:  $6.4 \times 10^{-2}$

$^{85}\text{Kr}$  in curies: 4.3

---

**Release Summary:** A drillback release occurred from the vent line on December 14, 1989, lasting for four minutes.

Seepage began on December 17, 1989, at approximately 1820 hours and continued until March 7, 1990.

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**References:** (E) (H) (X) (BD) (T1) (T3)

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**Test:** **METROPOLIS**

<b>Date:</b>	03/10/90	<b>Sponsor:</b>	LLNL
<b>Time:</b>	0800 PST	<b>Depth of Burial:</b>	1,540 ft
<b>Location:</b>	NTS U2gh	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

---

**Drillback Release Activity at Time of Release, in Curies:** 5.9

$^{133}\text{Xe}$  in curies: 5.7

$^{133\text{m}}\text{Xe}$  in curies:  $1.8 \times 10^{-1}$

$^{135}\text{Xe}$  in curies:  $7.7 \times 10^{-2}$

$^{131}\text{I}$  in curies:  $8.8 \times 10^{-5}$

$^{133}\text{I}$  in curies:  $1.9 \times 10^{-4}$

---

**Release Summary:** Drillback releases occurred as follows: (1) from the drilling platform intermittently between March 12-14, 1990, and (2) from the ventilation line March 14-15, 1990, when nine intermittent releases lasted for approximately one hour.

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**References:** (E) (BD) (CM) (CN) (CO) (T6)

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**Detonation:** **MINERAL QUARRY**  
(simultaneous with RANDBURG, separate drifts)

<b>Date:</b>	07/25/90	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	0800 PDT	<b>Depth of Burial:</b>	1,278 ft
<b>Location:</b>	NTS U12n.22	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled and Gas Sampling

---

**Controlled Release Activity at Time of Release, in Curies:**  $4.5 \times 10^{-1}$ \*

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**Isotopes Identified in the Release:**  $^{37}\text{Ar}$ ,  $^{39}\text{Ar}$ ,  $^{85}\text{Kr}$ ,  $^{131}\text{I}$ ,  $^{131\text{m}}\text{Xe}$ ,  $^{133}\text{Xe}$ , and  $^{133\text{m}}\text{Xe}$

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**Gas Sampling Release Activity at Time of Release, in Curies:** 2.4\*\*

$^{131\text{m}}\text{Xe}$  in curies:  $5.2 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $9.3 \times 10^{-2}$

$^{37}\text{Ar}$  in curies: 2.2

$^{39}\text{Ar}$  in curies:  $1.2 \times 10^{-3}$

$^{85}\text{Kr}$  in curies:  $7.3 \times 10^{-2}$

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**Release Summary:** Controlled ventilation occurred as follows: (1) from the LOS pipe between the tunnel and pipe seal (TAPS) and the gas seal auxiliary closure (GSAC) on August 16, 1990, from 0840 hours until August 17, 1990, at 0640 hours, and (2) from drilling and sampling of cavity gases intermittently between October 1 and December 5, 1990.

The effluent from the LOS pipe was not filtered before being introduced into the tunnel ventilation system, while effluent from drilling and cavity sampling was passed through a high-efficiency particulate air (HEPA) filter and a charcoal filter combination before being released.

Sampling of cavity gases was part of an experimental gas diagnostics program. The gas released during this operation was from purging the sampling line to ensure a representative sample, and therefore represents the upper limit of the radioactive effluent released.

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**References:** (E) (BD) (CG) (T8)

\*Released from ventilation of the LOS pipe between the tunnel and pipe seal and the gas seal auxiliary closure.

\*\*Total includes releases from drilling.

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**Test: TENABO**

**Date:** 10/12/90

**Sponsor:** LLNL

**Time:** 1030 PDT

**Depth of Burial:** 1,969 ft

**Location:** NTS U20bb

**Purpose:** Weapons Related

**Type:** Shaft

**Yield:** 20 to 150 kt

**Release Detected:** Onsite Only

**Type of Release:** Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $1.2 \times 10^{-3}$

$^{133}\text{Xe}$  in curies:  $2.4 \times 10^{-5}$

$^{131}\text{I}$  in curies:  $1.2 \times 10^{-3}$

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**Release Summary:** Drillback releases (xenon-133) occurred from the drilling platform at 0032 hours on October 19, 1990, lasting for two minutes, and at 0250 hours lasting for one minute. Iodine-131 was also released intermittently from the drilling platform from October 18-30, 1990.

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**References:** (E) (BE) (CK) (CL) (T6)

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**Test:** **HOUSTON**

<b>Date:</b>	11/14/90	<b>Sponsor:</b>	LANL/UK
<b>Time:</b>	1117 PST	<b>Depth of Burial:</b>	1,950 ft
<b>Location:</b>	NTS U19az	<b>Purpose:</b>	Joint US-UK
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $1.0 \times 10^{-4}$

$^{133}\text{Xe}$  in curies:  $1.0 \times 10^{-4}$

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**Release Summary:** A release occurred on November 23, 1990, and continued intermittently until December 28, 1990, after drillback operations were completed, but before cementback operations began.

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**References:** (E) (BE) (T7)

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**Test:** **BEXAR**

<b>Date:</b>	04/04/91	<b>Sponsor:</b>	LANL
<b>Time:</b>	1100 PST	<b>Depth of Burial:</b>	2,066 ft
<b>Location:</b>	NTS U19ba	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Cementback

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**Cementback Release Activity at Time of Release, in Curies:**  $5.0 \times 10^{-1}$

$^{133}\text{Xe}$  in curies:  $5.0 \times 10^{-1}$

$^{131}\text{I}$  in curies:  $1.0 \times 10^{-4}$

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**Release Summary:** A release occurred during cementback operations on April 14, 1991, lasting for 10 days.

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**References:** (E) (BE) (S0)

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**Test: DISTANT ZENITH**

<b>Date:</b>	09/19/91	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	0930 PDT	<b>Depth of Burial:</b>	865 ft
<b>Location:</b>	NTS U12p.04	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled and Gas Sampling

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**Controlled Release Activity at Time of Release, in Curies:**  $4.1 \times 10^{-1}$ \*

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**Isotopes Detected in the Release:**  $^{37}\text{Ar}$ ,  $^{39}\text{Ar}$ ,  $^{85}\text{Kr}$ ,  $^{127}\text{Xe}$ ,  $^{129\text{m}}\text{Xe}$ ,  $^{131\text{m}}\text{Xe}$ ,  $^{133}\text{Xe}$ , and  $^{133\text{m}}\text{Xe}$

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**Gas Sampling Release Activity at Time of Release, in Curies:** 3.7\*\*

$^{127}\text{Xe}$ in curies:	$3.6 \times 10^{-6}$
$^{131\text{m}}\text{Xe}$ in curies:	$2.0 \times 10^{-3}$
$^{133}\text{Xe}$ in curies:	$3.5 \times 10^{-2}$
$^{37}\text{Ar}$ in curies:	2.4
$^{39}\text{Ar}$ in curies:	$1.8 \times 10^{-4}$
$^{85}\text{Kr}$ in curies:	1.3
tritiated water in curies:	$1.4 \times 10^{-5}$

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**Release Summary:** Controlled filtered ventilations of the LOS pipe occurred as follows: (1) between the TAPS and the GSAC on October 8, 1991, lasting for 5.5 hours, and (2) between the GSAC and the fast acting closure (FAC) on March 17, 1992, lasting for 9.5 hours.

In addition, filtered releases of radioactivity occurred intermittently during gas sampling operations, as part of an experimental gas diagnostics program, between October 28 and December 17, 1991.

Release of noble gas occurred during operations when six probe holes were drilled to determine the size and shape of the chimney produced by the test. These releases occurred between May 12 and May 29, 1992. Because this work was done more than six months after test execution, the effluent released from these probe holes was not filtered.

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**References:** (E) (BE) (CH) (S1)

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\*Released from ventilation of the LOS pipe between the tunnel and pipe seal and the fast acting closure.

\*\*Total includes releases from probe hole drilling and related operations.

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**Test: LUBBOCK**

<b>Date:</b>	10/18/91	<b>Sponsor:</b>	LANL
<b>Time:</b>	1213 PDT	<b>Depth of Burial:</b>	1,500 ft
<b>Location:</b>	NTS U3mt	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	20 to 150 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:**  $8.3 \times 10^{-2}$

$^{133}\text{Xe}$  in curies:  $8.3 \times 10^{-2}$

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**Release Summary:** Xenon-133 was released during instrument calibration. The calibration began at 0800 hours on November 19, 1991, and lasted for six hours.

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**References:** (E) (BF) (S0)

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**Test: DIAMOND FORTUNE**

<b>Date:</b>	04/30/92	<b>Sponsor:</b>	DoD/LANL
<b>Time:</b>	0930 PDT	<b>Depth of Burial:</b>	776 ft
<b>Location:</b>	NTS U12p.05	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Controlled

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**Controlled Release Activity at Time of Release, in Curies:**  $2.4 \times 10^{-1}$

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**Isotopes Detected in the Release:**  $^{131}\text{I}$  and  $^{133}\text{Xe}$

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**Release Summary:** A controlled release through the tunnel ventilation system occurred intermittently between May 4 and July 2, 1992.

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**References:** (E) (BF) (CI) (S2)

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**Test: HUNTERS TROPHY**

<b>Date:</b>	09/18/92	<b>Sponsor:</b>	DoD/LLNL
<b>Time:</b>	1000 PDT	<b>Depth of Burial:</b>	1,264 ft
<b>Location:</b>	NTS U12n.24	<b>Purpose:</b>	Weapons Effects
<b>Type:</b>	Tunnel	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Gas Sampling

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**Gas Sampling Release Activity at Time of Release in Curies:  $9.1 \times 10^{-1}$** 

$^{127}\text{Xe}$ in curies:	$5.7 \times 10^{-6}$
$^{129\text{m}}\text{Xe}$ in curies:	$2.4 \times 10^{-5}$
$^{131\text{m}}\text{Xe}$ in curies:	$1.5 \times 10^{-2}$
$^{133}\text{Xe}$ in curies:	$3.9 \times 10^{-2}$
$^{37}\text{Ar}$ in curies:	$7.9 \times 10^{-1}$
$^{39}\text{Ar}$ in curies:	$8.1 \times 10^{-5}$
$^{85}\text{Kr}$ in curies:	$1.3 \times 10^{-2}$
$^3\text{H}$ in curies:	$5.0 \times 10^{-2}$
tritiated water in curies:	$1.8 \times 10^{-5}$

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**Release Summary:** Releases during drilling operations occurred as follows: (1) on November 18, 1992, beginning at 2100 hours and lasting for two hours and (2) on November 19, 1992, beginning at 0845 hours and lasting for two hours. During gas sampling operations, there were six intermittent releases between November 19, 1992, and January 5, 1993. Each release lasted less than 0.5 hours.

Effluent was passed through a HEPA and charcoal filter combination before being released through the tunnel ventilation system. Releases of radioactivity during gas sampling operations were part of an experimental gas diagnostics program.

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**References:** (E) (BF) (CJ) (S2)

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<b>Test:</b>	<b>DIVIDER</b>		
<b>Date:</b>	09/23/92	<b>Sponsor:</b>	LANL
<b>Time:</b>	0804 PDT	<b>Depth of Burial:</b>	1,397 ft
<b>Location:</b>	NTS U3ml	<b>Purpose:</b>	Weapons Related
<b>Type:</b>	Shaft	<b>Yield:</b>	Less than 20 kt
<b>Release Detected:</b>	Onsite Only	<b>Type of Release:</b>	Drillback

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**Drillback Release Activity at Time of Release, in Curies:  $1.1 \times 10^{-1}$** 

$^{133}\text{Xe}$ in curies:	$1.1 \times 10^{-1}$
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**Release Summary:** Xenon-133 was released during instrument calibration. Calibration began at 1000 hours on October 14, 1992, and lasted for four hours.

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**References:** (E) (BF) (T9)

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## REFERENCES

- A. DNA; Compilation of Local Fallout Data from Test Detonations 1945-1962, Extracted from DASA 1251, Volume I - Continental U.S. Tests; May 1, 1979 (DNA 1251-1-EX).\*
- B. LASL; Summary of Data from Underground Nuclear Test Events Conducted by or Using Devices Designed by LASL (U) (9/16/61-6/30/73); August 1974 (LA-5709). Document Classification [SRD]
- C. LLL; Data Summary of Underground Nuclear Tests Conducted at NTS (U) (9/15/61-12/31/79); February 15, 1980 (CN-TGD-530, Revision XI). Document Classification [SRD]
- D. Allen, R. E. (USAEC); Summary Information on Accidental Releases of Radioactivity to the Atmosphere from Underground Nuclear Detonations Designed for Containment, August 5, 1963 - June 30, 1971; June 1971 (WASH 1183).\*
- E. DOE/NV; United States Nuclear Tests - July 1945 through December 1992; December 1994 (DOE/NV-209, Rev. 14).\*
- F. USAEC; Offsite Environmental Contamination from Nuclear Explosives at NTS - September 15, 1961 - September 15, 1962; September 1962 (TID-18892).\*
- G. Allen, R. E. (USAEC); Summary Information on Releases of Radioactive Effluent to the Atmosphere from Underground Nuclear Detonations 1961-1964 (Deleted); October 1966 (WASH-1072).\*
- H. Pawloski, G. A. and Richardson, W. (LLNL); Selected Event Data (U); March 1990 (UCID-18532-90). Document Classification [CFRD]
- I. Oswald, K. M. (LLNL); Personal Conversations Re: LLNL Health & Safety Files.
- J. Dummer, J. E. (LANL); Personal Conversations Re: LANL Health & Safety Files.
- K. Metcalf, J. H. (SNL); Personal Conversations Re: DoD/SANDIA Health & Safety Files.
- L. Tucker, G. E. (SNL); Letter to H. M. Borella, EG&G, Subject: Summary of NTS Effluent Release Information on Sandia and DNA Events from 1962 to the Present; August 31, 1982.
- M. Black, S. C. (EPA); Personal Conversations Re: EPA Reports and Monitoring Logs.
- N. Hague, R. S. (DOE/NV); Memo to Test Authorities Liaison Office Files, Subject: Radioactive Release Quantities September 15, 1961, to Present; April 19, 1979.\*
- O. LLNL; Event Listing; February 1, 1988 (K-88-950).
- P. Rarrick, H. L. (SC); Letter to Col. J. T. Jones, DASA/TCDC, Subject: General Summary of Radioactive Effluent Releases; September 18, 1969.\*

---

\* These documents are available through the DOE/NV Public Reading Facility, 2621 Losee Road, North Las Vegas, Nevada 89030.

## REFERENCES (Continued)

- Q. Campbell, J. H. (DOE/NV/OEA); Personal Conversations.
- R. DoD/SC; "DoD-Sandia Effluent Release Summary March 5, 1966 - September 12, 1966" (Deleted); September 12, 1966.\*
- S. Campbell, J. H. (DOE/NV/OEA); Classification Notice - FENTON Event; September 11, 1987.
- T. DOE/NV; Containment and Safety Review for the MIGHTY OAK Nuclear Weapon Effects Test; May 1, 1987 (NVO-311).\*
- U. EPA; Off-Site Environmental Monitoring Report: Radiation Monitoring Around United States Nuclear Test Areas, Calendar Year 1986; May 1987 (EPA/600/4-87/017).\*
- V. Ristvet, B. L. (DNA/NVCG); Personal Conversations with D. L. Wheeler (DOE/NV/HPED) Re: DNA Files.
- W. Tucker, G. E. (SNL); Memo to L. J. O'Neill, DOE/NV/HPD, Subject: Update of NTS Tunnel Effluent Release History; May 20, 1986.
- X. Raschke, K. E. and Haerberlin, J. M. (LLNL); Personal Conversations Re: LLNL Health & Safety Files.
- Y. Smale, R. F. (LANL); Personal Conversations Re: LANL Health & Safety Files.
- Z. EPA; Summary of Accidental Releases of Radioactivity Detected Off the Nevada Test Site: 1963-1986; August 1988 (EPA/600/8-87/054).\*
- AA. H&N; NVOO Completion Report, Operation Mandrel (U); August 1971 (NVO-94). Document Classification [SRD]
- AB. H&N; NV Completion Report, Operation Emery (U); April 1972 (NVO-110). Document Classification [SRD]
- AC. H&N; NV Completion Report, Operation Grommet (U); February 1973 (NVO-122). Document Classification [SRD]
- AD. H&N; NV Completion Report, Operation Toggle (U); February 1974 (NVO-141). Document Classification [SRD]
- AE. H&N; NV Completion Report, Operation Arbor (U); February 1975 (NVO-150). Document Classification [SRD]
- AF. H&N; NV Completion Report, Operation Bedrock (U); January 1976 (NVO-162). Document Classification [SRD]
- AG. H&N; NV Completion Report, Operation Anvil (U); April 1977 (NVO-180). Document Classification [SRD]

## REFERENCES (Continued)

- AH. H&N; NV Completion Report, Operation Fulcrum (U); April 1978 (NVO-190). Document Classification [SRD]
- AI. H&N; NV Completion Report, Operation Cresset (U); May 1979 (NVO-201). Document Classification [SRD]
- AJ. H&N; NV Completion Report, Operation Quicksilver (U); May 1980 (NVO-215). Document Classification [SRD]
- AK. H&N; NV Completion Report, Operation Tinderbox (U); June 1981 (NVO-231). Document Classification [SRD]
- AL. H&N; NV Completion Report, Operation Guardian (U); June 1982 (NVO-237). Document Classification [SRD]
- AM. H&N; NV Completion Report, Operation Praetorian (U); September 1983 (NVO-246). Document Classification [SRD]
- AN. H&N; NV Completion Report, Operation Phalanx (U); March 1985 (NVO-278). Document Classification [SRD]
- AO. H&N; NV Completion Report, Operation Fusileer (U); December 1985 (NVO-292). Document Classification [SRD]
- AP. H&N; NV Completion Report, Operation Grenadier (U); April 1987 (NVO-301). Document Classification [SRD]
- AQ. H&N; NV Completion Report, Operation Charioteer (U); September 1987 (NVO-310). Document Classification [SRD]
- AR. H&N; Report of the Test Manager - Operation Storax (U); February 1964 (NVO-6). Document Classification [SRD]
- AS. H&N; Report of the Test Manager - Operation Niblick (U); January 1965 (NVO-19). Document Classification [SRD]
- AT. H&N; Report of the Test Manager - Operation Whetstone (U); April 1966 (NVO-25). Document Classification [SRD]
- AU. H&N; Report of the Test Manager - Operation Flintlock (U); March 1967 (NVO-33). Document Classification [SRD]
- AV. H&N; Report of the Test Manager - Operation Latchkey (U); May 1968 (NVO-36). Document Classification [SRD]
- AW. H&N; NVOO Completion Report, Operation Crosstie (U); June 1969 (NVO-42). Document Classification [SRD]
- AX. H&N; NVOO Completion Report, Operation Bowline (U); January 1970 (NVO-66). Document Classification [SRD]

## REFERENCES (Continued)

- AY. H&N; Report of the Test Manager - Operation Nougat (U); December 1963 (NVO-5).  
Document Classification [SRD]
- AZ. H&N; Project Manager's Report - Project Roller Coaster (U); May 1964 (NVO-10).  
Document Classification [CRD]
- BA. H&N; NV Completion Report, Operation Musketeer (U); March 1989 (NVO-324).  
Document Classification [SRD]
- BB. H&N; NVO Completion Report, Operation Touchstone Part II (U); August 1990  
(NVO-327). Document Classification [SRD]
- BC. RSN; NVO Completion Report, Operation Cornerstone Part II (U); February 1991  
(NVO-338). Document Classification [SRD]
- BD. RSN; NVO Completion Report, Operation Aqueduct Part II (U); September 1991  
(DOE/NV-342). Document Classification [SRD]
- BE. RSN; Nevada Operations Office Completion Report, Operation Sculpin Part II (U);  
June 1992 (DOE/NV-347). Document Classification [SRD]
- BF. RSN; Nevada Operations Office Completion Report, Operation Julin Part II (U); June 1993  
(DOE/NV - 359). Document Classification [SRD]
- CO. LLNL; Data Summary of Underground Nuclear Tests Conducted at NTS (U)  
(01/01/80-09/30/92); working document (CN-TGD-3254, revision of CN-TGN-530).  
Document Classification [SRD]
- CA. Metcalf, J. H. (SNL); Letter to B. F. Eubank, REECo, Subject: Effluent Documentation of  
the MIGHTY OAK Event; August 2, 1989.
- CB. Metcalf, J. H. (SNL); Letter to B. F. Eubank, REECo, Subject: Effluent Documentation of  
the MISSION GHOST Event; August 2, 1989.
- CC. Gottschalk, V. B. and Bennett, W. P. (LRL); Memo to Distribution, UC/LRL, Subject: EEL  
Venting, U9m; August 6, 1962.
- CD. Metcalf, J. H. (SNL); Letter to B. F. Eubank, REECo, Subject: Effluent Documentation of  
the MISTY ECHO Event; February 15, 1990.
- CE. Metcalf, J. H. (SNL); Letter to B. F. Eubank, REECo, Subject: Effluent Documentation of  
the DISKO ELM Event; March 29, 1990.
- CF. Metcalf, J. H. (SNL); Letter to R. Staley, OCC/OMB, Subject: Documentation of  
Radioactive Effluent Released During Reentry Mining Activities on the DISKO ELM  
Event; August 15, 1990.
- CG. Metcalf, J. H. (SNL); Letter to B. F. Eubank, REECo, Subject: Effluent Documentation of  
the MINERAL QUARRY Event; January 30, 1991.

## REFERENCES (Continued)

- CH. Metcalf, J. H. (SNL); Letter to M. R. Woolard, REECo, Subject: Effluent Documentation of the DISTANT ZENITH Event; January 26, 1993.
- CI. Metcalf, J. H. (SNL); Letter to M. R. Woolard, REECo, Subject: Effluent Documentation of the DIAMOND FORTUNE Event; March 25, 1993.
- CJ. Metcalf, J. H. (SNL); Letter to M. R. Woolard, REECo, Subject: Effluent Documentation of the HUNTERS TROPHY Event; February 3, 1993.
- CK. Haerberlin, J. M. (LLNL); Memorandum to File, Subject: Health Physics Summary Report - TENABO, U20BB; April 2, 1991.
- CL. Haerberlin, J. M. (LLNL); Memorandum to File, Subject: Radioactive Releases - TENABO, U20BB; December 11, 1990.
- CM. Haerberlin, J. M. (LLNL); Memorandum to File, Subject: Health Physics Summary Report - METROPOLIS, U2GH; April 1, 1991.
- CN. Haerberlin, J. M. (LLNL); Memorandum to File, Subject: Post-Shot Drilling Radiation Releases, METROPOLIS, U2GH; March 22, 1990.
- CO. Haerberlin, J. M. (LLNL); Memorandum to File, Subject: Iodine Release - METROPOLIS, U2GH; March 30, 1990.
- CP. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U20aa, COLBY Event; (U) August 14, 1980. Document Classification [CFRD]
- CQ. Evarts R. B. (LLNL); Memorandum to File, Subject: Postshot Ventline Release - U8m, FRISCO; January 12, 1983.
- CR. Raschke, K. E. (LLNL); Memorandum to File, Subject: Post Ventline Release - U2cq, GORBEA; February 9, 1984.
- CS. Raschke, K. E. (LLNL); Memorandum to File, Subject: Postevent Gas Sampling Release - U2ev; June 15, 1984.
- CU. Raschke, K. E. (LLNL); Memorandum to File, Subject: Release of  $^{85}\text{Kr}$  - KAPPELLI, U20am; March 3, 1986.
- CV. Raschke, K. E. (LLNL); Memorandum to File, Subject: Postshot Releases - BRETON, U4ar; October 17, 1984.
- CW. Raschke, K. E. (LLNL); Memorandum to File, Subject: Accidental Severing Gas Sampling Line - U4ar, BRETON; January 18, 1985.
- CX. Raschke, K. E. (LLNL); "TIERRA Seep Results"; September 10, 1985.
- CY. Haerberlin, J. M. (LLNL); Memorandum to K. E. Raschke, LLNL, Subject: Postshot Drilling Radiation Releases, KAWICH, U2cu; April 10, 1989.

## REFERENCES (Continued)

- CZ. Raschke, K. E. (LLNL); Memorandum to File, Subject: Postshot Ventline Release - U20ad, PEPATO; June 26, 1979.
- DA. USPHS; Operation NOUGAT Final Report - U.S. Public Health Service Off-Site Radiological Safety; April 24, 1964 (SWRHL-1r).\*
- DB. USPHS; Operation STORAX Final Report - U.S. Public Health Service Off-Site Radiological Safety; July 20, 1965 (SWRHL-4r).\*
- DC. USPHS; Project GNOME - Final Report - Off-Site Radiological Safety Report; May 22, 1962 (PNE-132F).\*
- DD. USPHS; Final Off-Site Report of the Project SEDAN Event, July 6, 1962, Plowshare Program; December 12, 1962 (PNE-200F).\*
- DE. Coogan, J. S.; Wait, D. L.; and Waligora, S. J. (USPHS); Operation ROLLER COASTER - Project Officer's Report 2.8, Off-Site Survey; September 17, 1968 (WT-2511) POR-2511.\*
- DF. USPHS; "Final Report of Off-Site Surveillance for the PIKE Event of March 13, 1964" (Draft); July 28, 1964.\*
- DG. USPHS; Final Report of Off-Site Surveillance for Operation Niblick, July 1, 1963 - June 30, 1964; April 1, 1966 (SWRHL-12r).\*
- DH. USPHS; "Final Report of Off-Site Surveillance for the ALVA Event of August 19, 1964" (Draft); October 13, 1964.\*
- DI. USPHS; Final Report of Off-Site Surveillance for the DRILL Event of December 5, 1964; October 18, 1965 (SWRHL-21r).\*
- DJ. USPHS; "Final Report of Off-Site Surveillance for Project SULKY"; March 9, 1965.\*
- DK. USPHS; Final Report of Off-Site Surveillance for Project PALANQUIN; October 19, 1965 (PNE-910F).\*
- DL. EPA; Final Report of Off-Site Surveillance for the PIN STRIPE Event, April 25, 1966; February 1972 (SWRHL-59r).\*
- DM. USPHS; "Final Report - Addendum I, PIN STRIPE Event, April 25, 1966"; November 22, 1966.\*
- DN. USPHS; "Final Report - Addendum, NASH Event, January 19, 1967"; July 28, 1967.\*
- DO. USPHS; "Test Manager's Report - Operation Crosstie"; August 27, 1968.\*
- DP. USPHS; Project BUGGY, Off-Site Environmental Surveillance; January 29, 1971 (PNE-327).\*
- DQ. EPA; Final Report of Off-Site Surveillance for Project SCHOONER; September 27, 1971 (PNE-524).\*

## REFERENCES (Continued)

- DR. EPA; "Project RULISON Off-Site Surveillance for the Flaring Operation, August 1, 1970 - April 23, 1971 (Preliminary Report)"; May 28, 1971.\*
- DS. EPA; Final Report of Off-Site Surveillance for the BANE BERRY Event, December 18, 1970; February 1972 (SWRHL-107r).\*
- DT. Black, S. C.; Smith, A. E.; and Costa, C. F. (EPA); Off-Site Monitoring for the MIGHTY OAK Nuclear Test; July 1986 (EPA/600/4-86-030).\*
- DU. USAEC/NVO; "Operational Safety Plan - Project SHOAL"; May 1963.\*
- DV. EPA; "Report of Offsite Surveillance for the MISTY RAIN Tunnel Ventilation"; May 1985.\*
- DW. USPHS; "Interim Report of Off-Site Surveillance for the DIAMOND DUST Event of May 12, 1970"; May 1970.
- DX. USPHS; Offsite Surveillance Activities of the Southwestern Radiological Health Laboratory from January through June 1965; July 1, 1966 (SWRHL-23r).\*
- DY. EPA; Off-Site Surveillance Activities of the Southwestern Radiological Health Laboratory from January through June 1968; January 1972 (SWRHL-81r).\*
- DZ. USPHS; "Off-Site Environmental Surveillance Results for CABRIOLET" (Paper presented to Sub-Committee); February 28, 1968.\*
- E0. USPHS; "MILKSHAKE Event, Aerial Monitoring and Sampling, March 25, 1968"; August 7, 1969.
- E1. USPHS; "MINUTE STEAK Event, Aerial Monitoring and Sampling, September 12, 1969"; September 22, 1969.
- E2. USPHS; "Aerial Cloud Tracking and Sampling Report for PIN STRIPE Event of April 25, 1966"; September 30, 1966.
- EA. USPHS; "Flight Report - MINK Event - Log of Aerial Cloud Tracking, October 29, 1961" (Handwritten Report); October 29, 1961.\*
- EB. Andrews, V. E. (USPHS); "Flight Report - HAYMAKER Event - Log of Aerial Cloud Tracking, June 27, 1962" (Handwritten Report); June 27, 1962.\*
- EC. USPHS; "Aerial Cloud Tracking and Sampling Report for ALVA Event - August 19, 1964"; August 19, 1964.\*
- ED. EG&G; "Nevada Aerial Tracking System Nevada Test Site for DRILL Event, December 5, 1964 (NATS Support of NVOO-NTS Activities, Preliminary Report)"; December 14, 1964.\*
- EE. Eckrich, P. D. (USPHS); Memo to Chief, EDP/SWRHL, Subject: PARROT Flight Report - December 16, 1964; December 22, 1964.\*

## REFERENCES (Continued)

- EF. USPHS; "Aerial Cloud Tracking and Sampling Report for PARROT Event - December 16, 1964"; December 16, 1964.\*
- EG. USPHS; "Aerial Cloud Tracking and Sampling Report for TEE Event - May 7, 1965"; May 7, 1965.\*
- EH. USPHS; "Cloud Tracking Support for RED HOT Event - March 5, 1966"; March 1966.\*
- EI. USPHS; "Aerial Cloud Tracking and Sampling for DOUBLE PLAY Event - June 15, 1966 (Preliminary Report)"; July 29, 1966.\*
- EJ. USPHS; "Aerial Cloud Tracking and Sampling for DOUBLE PLAY Event, June 15, 1966 - Final Report"; November 22, 1966.\*
- EK. USPHS; "Aerial Monitoring and Sampling, Environmental Surveillance, MIDI MIST Event, June 26, 1967"; June 30, 1967.\*
- EL. USPHS; "Aerial Monitoring and Sampling, Environmental Surveillance, DOOR MIST Event, August 31, 1967"; September 5, 1968.\*
- EM. Hand, J. E. and Weissman, V. F. (EG&G); Nevada Aerial Tracking System [NATS] Event: DOOR MIST; September 14, 1967 (EGG-1183-1348).\*
- EN. USPHS; "Aerial Surveillance and Monitoring, HUPMOBILE Event, January 18, 1968 (Preliminary Report)"; January 1968.\*
- EO. EG&G; "NATS/ARMS HUPMOBILE Effluent Tracking Summary Report, January 18, 1968"; January 18, 1968.\*
- EP. EG&G; "NATS/ARMS Cloud Track and Ground Deposition Summary: CABRIOLET Event Support, January 18, 1968"; January 1968.\*
- EQ. USPHS; "Aerial Monitoring and Sampling - POD Event, October 29, 1969"; March 27, 1970.\*
- ER. USPHS; "Aerial Monitoring and Cloud Tracking - SCUTTLE Event, November 13, 1969 (Handwritten Notes)"; November 13, 1969.\*
- ES. EG&G; "NATS Tracking Report Summary - SCUTTLE Event, November 13, 1969"; November 25, 1969.\*
- ET. USPHS; Memo to Project Officer USPHS, Subject: Flight Report - May 5, 1970, MINT LEAF Event; May 15, 1970.\*
- EU. EG&G; "Cloud Tracking Mission Summary, Nevada Aerial Tracking Systems [NATS] - DIAGONAL LINE Event"; November 24, 1971.\*
- EV. EG&G; "Aerial Radiological Monitoring, Nevada Test Site - FENTON Event, April 23, 1966"; NATS Mission Report No. 8-F-66 (Deleted); May 25, 1966.

## REFERENCES (Continued)

- EW. USPHS; "Aerial Sampling Report - DILUTED WATERS Event, June 16, 1965"; June 1965.
- EX. USPHS; "Aerial Monitoring and Sampling Report - DIANA MOON Event, August 27, 1968"; November 27, 1968.
- EY. USPHS; "Final Report - RED HOT Event, March 5, 1966"; March 1966.
- EZ. USPHS; "Final Report of Aerial Monitoring and Sampling for the RUSSET Event, March 5, 1968"; February 1970.
- FA. USPHS; "PIKE Event - Monitoring and Sampling Data Tables"; March 13, 1964.\*
- FB. USPHS; "Survey Meter Monitoring Logs - PARROT Event"; December 16, 1964.\*
- FC. USPHS; "Survey Meter Monitoring Logs - TEE Event"; May 7, 1965.\*
- FD. USPHS; "Survey Meter Monitoring Logs - DERRINGER Event"; September 12, 1966.\*
- FE. USPHS; "Survey Meter Monitoring Logs - MINT LEAF Event, May 5, 1970"; May 6, 1970.\*
- FF. USPHS; "PALANQUIN Event - Survey Meter Monitoring Logs"; April 17, 1965.\*
- G0. USPHS; "Interim Report of Off-Site Surveillance for the FENTON Event of April 23, 1966"; June 23, 1966.\*
- G1. USPHS; "Interim Off-Site Report of the CHENA Event of October 10, 1961"; November 15, 1961.\*
- GA. USPHS; "Interim Off-Site Report of the ANTLER Event, September 15, 1961"; November 1, 1961.\*
- GB. USPHS; "Interim Off-Site Report of the MINK Event, Operation Nougat, October 29, 1961"; November 1, 1961.\*
- GC. USPHS; "Interim Off-Site Report of the FEATHER Event, December 22, 1961"; January 29, 1961.\*
- GD. USPHS; "Interim Off-Site Report of the STOAT Event, January 9, 1962"; January 29, 1962.\*
- GE. USPHS; "Interim Off-Site Report of the PAMPAS Event, March 1, 1962, Operation Nougat II"; April 27, 1962.\*
- GF. USPHS; "DANNY BOY Report - Interim Off-Site Report of the Event of March 5, 1962 - Operation Nougat II"; June 22, 1962.\*
- GG. USPHS; "Interim Off-Site Report of the PLATTE Event, April 14, 1962, Operation Nougat III"; July 3, 1962.\*

## REFERENCES (Continued)

- GH. USPHS; "Interim Off-Site Report of the EEL Event, May 19, 1962, Operation Nougat III"; July 10, 1962.\*
- GI. USPHS; "Interim Off-Site Report of the DES MOINES Event, June 13, 1962, Operation Nougat III"; August 10, 1962.\*
- GJ. USPHS; "Interim Off-Site Report of the HAYMAKER Event, June 27, 1962, Operation Nougat III"; July 10, 1962.\*
- GK. USPHS; "Interim Off-Site Report of the JOHNNIE BOY Event, July 11, 1962, Operation Dominic II"; October 25, 1962.\*
- GL. USPHS; "Interim Off-Site Report of the SMALL BOY Event, July 14, 1962, Operation Dominic II"; November 8, 1962.\*
- GM. USPHS; "Interim Off-Site Report of the LITTLE FELLER I Event, July 17, 1962, Operation Storax"; September 4, 1962.\*
- GN. USPHS; "Interim Off-Site Report of the WICHITA Event, July 27, 1962, Operation Storax"; August 15, 1962.\*
- GO. USPHS; "Interim Off-Site Report of the BANDICOOT Event, October 19, 1962, Operation Storax"; March 6, 1963.\*
- GP. USPHS; "Project Roller Coaster - DOUBLE TRACKS Event (Interim Report)"; May 15, 1963.\*
- GQ. USPHS; "Project Roller Coaster - CLEAN SLATE I Event (Interim Report)"; May 25, 1963.\*
- GR. USPHS; "Project Roller Coaster - CLEAN SLATE II Event (Interim Report)"; May 31, 1963.\*
- GS. USPHS; "Interim Off-Site Report of the YUBA Event, June 5, 1963, Operation Storax"; July 9, 1963.\*
- GT. USPHS; "Project Roller Coaster - CLEAN SLATE III Event (Interim Report)"; June 9, 1963.\*
- GU. USPHS; "Interim Off-Site Report of the EAGLE Event, December 12, 1963, Operation Niblick"; January 31, 1964.\*
- GV. USPHS; "Interim Report of Off-Site Surveillance for the OCONTO Event of January 23, 1964"; August 3, 1964.\*
- GW. USPHS; "Interim Report of Off-Site Surveillance for the ALVA Event of August 19, 1964"; November 6, 1964.\*
- GX. USPHS; "Interim Report of Off-Site Surveillance for the PARROT Event of December 16, 1964"; October 4, 1965.\*

## REFERENCES (Continued)

- GY. USPHS; "Test Manager's Report for Operation Whetstone"; November 18, 1965 (SWRHL-22r).\*
- GZ. USPHS; "Interim Report of Off-Site Surveillance for the ALPACA Event of February 12, 1965"; August 29, 1966.\*
- HA. USPHS; "Interim Report of Off-Site Surveillance for the Tee Event of May 7, 1965"; November 1, 1965.\*
- HB. USPHS; "Interim Report of Off-Site Surveillance for the DILUTED WATERS Event of June 16, 1965"; November 10, 1965.\*
- HC. Niles, G. W. (USPHS); Memo to D. L. Wait, USPHS, Subject: Ground Monitoring Results, DILUTED WATERS Event; June 21, 1965.\*
- HD. USPHS; "Interim Report of Off-Site Surveillance for the RED HOT Event of March 5, 1966"; August 24, 1966.\*
- HE. USPHS; "Interim Report of Off-Site Surveillance for the DOUBLE PLAY Event of June 15, 1966"; July 29, 1966.\*
- HF. USPHS; "Interim Report of Off-Site Surveillance for the DERRINGER Event of September 12, 1966"; December 21, 1966.\*
- HG. USPHS; "USPHS Record of Off-Site Surveillance for DERRINGER Event, September 12, 1966"; September 12, 1966.\*
- HH. USPHS; "Interim Report of Off-Site Surveillance for the NASH Event of January 19, 1967"; February 24, 1967.\*
- HI. USPHS; "Interim Report of Off-Site Surveillance for the MIDI MIST Event of June 26, 1967"; June 26, 1967.\*
- HJ. USPHS; "Off-Site Surveillance Information for MIDI MIST Event" (Draft); June 28, 1967.\*
- HK. USPHS; "Interim Report of Off-Site Surveillance for the UMBER Event of June 29, 1967"; December 5, 1967.\*
- HL. Hartzog, L. D. (USPHS); "USPHS Record of Off-Site Surveillance for DOOR MIST Event, August 31, 1967"; September 1, 1967.\*
- HM. USPHS; "Interim Report of Off-Site Surveillance for the DOOR MIST Event of August 31, 1967"; June 1968.\*
- HN. USPHS; "Interim Report of Off-Site Surveillance for the HUPMOBILE Event of January 18, 1968"; October 7, 1968.\*
- HO. Corkern, W. D. (USPHS); "USPHS Record of Off-Site Surveillance, HUPMOBILE Event, January 18, 1968"; January 22, 1968.\*

## REFERENCES (Continued)

- HP. USPHS; "Off-Site Surveillance of Releases from the Nevada Test Site, January Through May 1968"; May 1968.\*
- HQ. Fort, C. W. (USPHS); "USPHS Record of Off-Site Surveillance, CABRIOLET Event, January 26, 1968"; January 26, 1968.\*
- HR. Gotchy, R. L. (EPA); "Project RULISON - Interim Radioactivity Report Intermediate-Rate Flaring"; February 1971.\*
- HS. USPHS; "Interim Report of Off-Site Surveillance for the POD Event of October 29, 1969"; December 1969.\*
- HT. USPHS; "Interim Report of Off-Site Surveillance for the SNUBBER Event of April 21, 1970"; June 1970.\*
- HU. USPHS; "Interim Report of Off-Site Surveillance for the MINT LEAF Event of May 5, 1970"; May 1970.\*
- HV. Stein, J. L. (USPHS); "USPHS Record of Off-Site Surveillance, MINT LEAF Event, May 5, 1970"; May 19, 1970.\*
- HW. EPA; "Interim Report of Off-Site Surveillance for the DIAGONAL LINE Event of November 24, 1971"; November 1971.\*
- HX. McBride, J. R. (EPA); Memo to File, Subject: Events Regarding DIAGONAL LINE on November 24-25, 1971; December 9, 1971.\*
- HY. EPA; "Interim Report of Off-Site Surveillance for the RIOLA Test of September 25, 1980"; September 1980.\*
- HZ. EPA; "Interim Report of Off-Site Surveillance for the GLENCOE Test of March 22, 1986"; March 1986.\*
- J0. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U2m, FENTON Event; (U) May 31, 1966. Document Classification [CFRD]
- J1. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U9bx, NOGGIN Event; (U) September 20, 1968. Document Classification [CFRD]
- J2. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: TAPPER Release; July 11, 1969.
- J3. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: UMBER Release; August 4, 1967.
- J4. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: WAGTAIL Release; May 17, 1965.

## REFERENCES (Continued)

- J5. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: PLIERS Release; October 7, 1969.
- J6. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U10b, HANDCAR Event; December 21, 1964.
- J7. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: KESTREL Release; May 17, 1965.
- J8. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: MANZANAS Release; November 6, 1970.
- JA. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - TOYAH Event; March 29, 1963.\*
- JB. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - CUMBERLAND Event; April 18, 1963.\*
- JC. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - KOOTANAI - PAISANO Events; May 1, 1963.\*
- JD. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - STONES Event; May 28, 1963.\*
- JE. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Supplement to Interim Report - STONES Event; August 30, 1963.\*
- JF. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - PLEASANT Event; June 7, 1963.\*
- JG. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Supplement to Interim Report - PLEASANT Event; August 29, 1963.\*
- JH. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - APSHAPA Event; June 24, 1963.\*
- JI. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - KENNEBEC Event; July 10, 1963.\*
- JJ. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - UE20h, REX Event; (U) May 16, 1966. Document Classification [CFRD]
- JK. LASL; Memo to T. L. Shipman, LASL/H-DO, Subject: Documentation of the Airborne Radioactivity Released by Underground Nuclear Test Detonations - PEKAN Event; September 25, 1963.\*
- JL. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - KOHOCTON Event; August 27, 1963.\*

## REFERENCES (Continued)

- JM. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report - TORNILLO Event; October 29, 1963.\*
- JN. Browne, C. I. (LASL); Letter to R. E. Miller, AEC/NVOO, Subject: Estimates - Residual Activity - SHOAL Event; July 28, 1970.\*
- JO. Meadows, J. and Henderson, R. (LASL); Memo to Distribution, LASL, Subject: Results of the H-8 Sampling Program for the ANCHOVY Event; January 16, 1964.\*
- JP. Rich, B. L. and Olsen, J. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report U9at, MUSTANG Event (Deleted); April 16, 1964.\*
- JQ. Rich, B. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - EAGLE Event (Deleted); April 10, 1964.\*
- JR. Rich, B. L. and Olsen, J. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report U9ao, FORE Event (Deleted); March 19, 1964.\*
- JS. Olsen, J. L. (LRL); Memo to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U9ay, OCONTO Event (Deleted); February 17, 1964.\*
- JT. Rich, B. L. and Olsen, J. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U10e - KLICKITAT Event (Deleted); April 1, 1964.\*
- JU. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: PIKE Drill-Back; April 20, 1964.\*
- JV. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: STURGEON Event; April 20, 1964.\*
- JW. Rich, B. L. and Olsen, J. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Forty-Eight Hour Post-Drilling Report - U10c, TURF Event; May 1, 1964.\*
- JX. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U10c, TURF Event (Deleted); June 3, 1964.\*
- JY. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: PIPEFISH Release; May 4, 1964.\*
- JZ. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9aw, BACKSWING Event (Deleted); October 6, 1964.\*
- KA. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U2n, ACE Event (Deleted); July 6, 1964.\*
- KB. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U9be, FADE Event (Deleted); July 21, 1964.\*

## REFERENCES (Continued)

- KC. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U10a, DUB Event (Deleted); September 28, 1964.\*
- KD. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U10i, BYE Event (Deleted); September 16, 1964.\*
- KE. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2j, ALVA Event (Deleted); October 28, 1964.\*
- KF. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2p, PAR Event; November 17, 1964.\*
- KG. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U7a, FOREST Event (Deleted); November 19, 1964.\*
- KH. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2q, CREPE Event (Deleted); January 7, 1965.\*
- KI. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Forty-Eight Hour Post-Shot Report - U2ai, DRILL Event; December 7, 1964.\*
- KJ. Thalgott, R. H. (USAEC/NVOO); Memo to G. M. Dunning, AEC-HQ/DOS, Subject: PARROT and DRILL Events; April 2, 1965.\*
- KK. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U10n, MUDPACK Event; January 13, 1965.\*
- KL. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Appendum to Interim Report - U10n, MUDPACK Event, Dated January 13, 1965; February 10, 1965.\*
- KM. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bb, WOOL Event (Deleted); February 2, 1965.\*
- KN. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2a, ALPACA Event (Deleted); April 14, 1965.\*
- KO. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Forty-Eight Hour Post-Shot Report - U5a, WISHBONE Event (Deleted); February 24, 1965.\*
- KP. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Forty-Eight Hour Post-Drilling Report - U5a, WISHBONE Event (Addendum); March 2, 1965.\*
- KQ. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U5a, WISHBONE Event (Deleted); May 27, 1965.\*
- KR. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9cb, CUP Event (Deleted); May 26, 1965.\*
- KS. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U20k, PALANQUIN Event (Deleted); October 1, 1965.\*

## REFERENCES (Continued)

- KT. Burnett, W. D. (SC); Memo to J. J. Neuer, SC/TGD, Subject: Area 16 Source Determination and Preliminary Effluent Release Report - H Plus 48 Hours; April 23, 1965.\*
- KU. Burnett, W. D. (SC); Memo to J. J. Neuer, SC/TGD, Subject: Effluent Documentation for the GUMDROP Event - Final Report; April 30, 1965.\*
- KV. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2ab, TEE Event (Deleted); August 6, 1965.\*
- KW. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bn, TWEED Event (Deleted); August 10, 1965.\*
- KX. Rarrick, H. L. (SC); Memo to M. Colvin, SC, Subject: TINY TOT, U15e, Source Determination and Effluent Release Report, H Plus 48 Hours (Enclosure - Postshot Laboratory Report, REECO, June 18, 1965); June 19, 1965.\*
- KY. Rarrick, H. L. (SC); Memo to Distribution, SC, Subject: Effluent Documentation of TINY TOT Event (Enclosure - Interim Laboratory Report, REECO, July 27, 1965); November 9, 1965.\*
- KZ. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2ak, CENTAUR Event (Deleted); November 4, 1965.\*
- L0. Rarrick, H. L. (SC); Memo to J. A. Bower, SC/TGD, Subject: Release Estimate for U11c, NEW POINT; December 15, 1966.\*
- L1. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10af, YARD Event (Deleted); October 25, 1967.\*
- L2. Oswald, K. M. (LLNL); Memo to D. C. Oakley, LLNL, Subject: Health & Safety Final Report - U7ak, ESROM Event; August 8, 1978.
- L3. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: PARROT Release (Deleted); February 10, 1965.\*
- L4. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U16a.02, GUMDROP Event; September 14, 1965.
- L5. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U9az, TINDERBOX Event; March 4, 1969.
- LA. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bs, ELKHART Event (Deleted); November 10, 1965.\*
- LB. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U10k, CORDUROY Event (Deleted); January 13, 1966.\*
- LC. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U2al, EMERSON Event (Deleted); January 11, 1966.\*

## REFERENCES (Continued)

- LD. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U9br, MAXWELL Event (Deleted); February 11, 1966.\*
- LE. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U2r, PLAID II Event (Deleted); March 8, 1966.\*
- LF. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U9ce, CLYMER Event (Deleted); May 4, 1966.\*
- LG. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U9ht, TEMPLAR Event (Deleted); May 3, 1966.\*
- LH. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U2ca, STUTZ Event (Deleted); May 27, 1966.\*
- LI. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2bv, PORTULACA Event; (U) December 5, 1980. Document Classification [CFRD]
- LJ. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U20a, DURYEAE Event; May 25, 1966.\*
- LK. Weart, W. D. (SC); "Results of the PIN STRIPE Post Shot Re-Entry Program"; October 10, 1966.\*
- LL. Wenz, G. R. (SC); Effluent Release Documentation of the PIN STRIPE Event (Deleted); December 1, 1967 (RS 3312/71).\*
- LM. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U2cd, TRAVELLER Event (Deleted); June 13, 1966.\*
- LN. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2an, TAPESTRY Event (Deleted); August 12, 1966.\*
- LO. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2t, DUMONT Event (Deleted); July 20, 1966.\*
- LP. Rarrick, H. L. (SC); Letter to Distribution, SC, Subject: PILE DRIVER Effluent Documentation, U15a; November 9, 1967.\*
- LQ. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10p, KANKAKEE Event (Deleted); July 26, 1966.\*
- LR. Rarrick, H. L. (SC); Memo to J. J. Neuer, DASA/TOB/WTD, Subject: Final Estimates of Effluent Release from U16a - DOUBLE PLAY (Enclosure - DOUBLE PLAY Event, U16a, Interim Laboratory Report, REECo, 9/12/66); September 21, 1966.\*
- LS. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2bd, VULCAN Event; August 18, 1966.\*

## REFERENCES (Continued)

- LT. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2cc, SAXON Event (Deleted); August 25, 1966.\*
- LU. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10s, ROVENA Event (Deleted); September 16, 1966.\*
- LV. King, W. C. (LRL) Memo to C. E. Williams, UC/LRL, Subject: Correction to Health & Safety Interim Report - U10s, ROVENA Event; October 10, 1966.\*
- LW. Rarrick, H. L. (SC); Memo to R. M. Tidwell, SC, Subject: Area U5i Source Determination and Effluent Release Report (Enclosure - DERRINGER Event, U5i, Interim Laboratory Report, REECo, 10/5/66) September 19, 1966.\*
- LX. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10u, NEWARK Event (Deleted) ; January 9, 1967.\*
- LY. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10w, SIMMS Event (Deleted); January 4, 1967.\*
- LZ. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U9al, AJAX Event (Deleted); January 17, 1967.\*
- M0. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2ce, NASH Event (Deleted); March 31, 1967.\*
- M1. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10y, RIVET III Event (Deleted); April 26, 1967.\*
- M2. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2am, COMMODORE Event; July 19, 1967.\*
- M3. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U20d, KNICKERBOCKER Event; August 17, 1967.\*
- M4. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U9bv, SWITCH Event (Deleted); September 21, 1967.\*
- M5. Rarrick, H. L. (SC); Memo to Distribution, Subject: Estimate of Filtered Effluent Release from Ventilation System of U12n MIDI MIST; October 19, 1967.\*
- M6. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10q, STANLEY Event (Deleted); September 20, 1967.\*
- M7. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10r, WASHER Event (Deleted); September 19, 1967.\*
- M8. Rarrick, H. L. (SC); "Memo to Distribution, Subject: Effluent Release Report for DOOR MIST, U12g.07"; February 12, 1968.\*

## REFERENCES (Continued)

- M9. Rarrick, H. L. (SC); Memo to Distribution, Subject: Effluent Release Report for DOOR MIST, U12g.07; April 3, 1968.\*
- MA. USAEC/NVO; "Event Summary Sheet for ALVA Event"; April 2, 1973.\*
- MB. USAEC/NVO; "Event Summary Sheet for PARROT Event"; April 3, 1973.\*
- MC. USAEC/NVO; "Event Summary Sheet for ALPACA Event"; March 14, 1973.\*
- MD. USAEC/NVOO; "Event Summary Sheet for WISHBONE Event"; February 18, 1965.\*
- ME. USAEC/NVO; "Event Summary Sheet for DILUTED WATERS Event"; March 15, 1973.\*
- MF. USAEC/NVO; "Event Summary Sheet for EMERSON Event"; March 15, 1973.\*
- MG. USAEC/NVO; "Event Summary Sheet for PLAID II Event"; March 14, 1973.\*
- MH. USAEC/NVO; "Event Summary Sheet for TYG Event"; April 2, 1973.\*
- N0. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10ds, MARVEL Event; December 6, 1967.\*
- N1. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2x, LANPHER Event (Deleted); December 14, 1967.\*
- N2. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2y, HUPMOBILE Event (Deleted); March 28, 1968.\*
- N3. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10ah, STACCATO Event (Deleted); February 20, 1968.\*
- N4. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2at, KNOX Event (Deleted); April 4, 1968.\*
- N5. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10t, SHUFFLE Event (Deleted); June 4, 1968.\*
- N6. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10aj, TUB Event (Deleted); September 4, 1968.\*
- N7. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2dt, TANYA Event (Deleted); September 10, 1968.\*
- N8. Rarrick, H. L. (SC); Memo to Distribution, Subject: Effluent Release Report for DIANA MOON, U11e; September 9, 1968.\*
- N9. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2cm, STODDARD Event (Deleted); November 11, 1968.\*
- NA. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2dc, TYG Event (Deleted); March 10, 1969.\*

## REFERENCES (Continued)

- NB. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2u, PACKARD Event (Deleted); June 10, 1969.\*
- NC. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2de, COFFER Event (Deleted); June 25, 1969.\*
- ND. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2df, HUTCH Event (Deleted); October 27, 1969.\*
- NE. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2bp, SPIDER Event (Deleted); October 29, 1969.\*
- NF. Rarrick, H. L. (SC); Memo to Distribution, Subject: Effluent Release Report for U11f, MINUTE STEAK; October 13, 1969.\*
- NG. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U20b, PIPKIN Event (Deleted); December 18, 1969.\*
- NH. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2ch, POD Event (Deleted); February 10, 1970.\*
- NI. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2bh, SCUTTLE Event (Deleted); January 21, 1970.\*
- NJ. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U9hi, TERRINE Event (Deleted); February 5, 1970.\*
- NK. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U8b, CYATHUS Event (Deleted); June 3, 1970.\*
- NL. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U9ITS, HOD Event (Deleted); June 22, 1970.\*
- NM. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2az, FLASK Event (Deleted); October 16, 1970.\*
- NN. Tucker, G. E. (SL); Memo to Distribution, Subject: Effluent Release Report for U12e.12 - HUDSON MOON; October 26, 1970.\*
- NO. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2dd, ARNICA Event (Deleted); September 15, 1970.\*
- NP. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2dg, CARPETBAG Event; March 12, 1971.\*
- NQ. Ide, R. (LRL); Memo to Distribution, Subject: BANE BERRY Release - Revised Evaluation (Deleted); May 26, 1971.\*
- NR. King, W. C. (LLL); Memo to P. E. Coyle, LLL, Subject: Health & Safety Final Report - U2br, HAREBELL Event (Deleted); October 20, 1971.\*

## REFERENCES (Continued)

- NS. Metcalf, J. H. (SL); Memo to Distribution, Subject: Effluent Release Report for U12g.10 - CAMPHOR; August 19, 1971.\*
- NT. King, W. C. (LLL); Memo to P. E. Coyle, LLL, Subject: Health & Safety Final Report - U2bu, MINIATA Event; October 27, 1971.\*
- NU. Metcalf, J. H. (SL); Memo to Distribution, Subject: Effluent Release Report for U12g.11 - DIAGONAL LINE; January 13, 1972.\*
- NV. King, W. C. (LLL); Memo to F. O. Beane, LLL, Subject: Health & Safety Final Report - U2dk, ZINNIA Event (Deleted); August 14, 1972.\*
- NW. Scolman, T. T. (LASL); Letter to Site Manager, NTSO, Subject: Activity Released from ANGUS Event - Final Report (August 2, 1973); August 2, 1973.\*
- NX. Oswald, K. M. (LLL); Memo to D. C. Oakley, LLL, Subject: Health & Safety Final Report - U2dv, FALLON Event (Deleted); August 7, 1978.\*
- NY. Rarrick, H. L. (SC); Memo to Distribution, Subject: Effluent Documentation Report for the RED HOT Event (Deleted); November 13, 1967.\*
- NZ. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2dr, CABRILLO Event; (U) December 12, 1980. Document Classification [CFRD]
- O0. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2ei, COULOMMIERS Event; (U) December 15, 1980. Document Classification [CFRD]
- O1. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2fa, FARALLONES Event; (U) December 9, 1980. Document Classification [CFRD]
- O2. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U2en, REBLOCHEN Event; April 20, 1979.
- O3. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2fb, QUARGEL Event; (U) January 26, 1984. Document Classification [CFRD]
- O4. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2eo, KLOSTER Event; (U) February 1, 1984. Document Classification [CFRD]
- O5. Oswald, K. M. (LLNL); Memo to R. H. Ide, LLNL, Subject: Health & Safety Final Report - U2fd, TARKO Event; (U) October 3, 1986. Document Classification [CFRD]
- O6. Oswald, K. M. (LLNL); Memo to R. H. Ide, LLNL, Subject: Health & Safety Final Report - U2cp, CABOC Event; (U) September 30, 1987. Document Classification [CFRD]
- O7. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Postshot Drilling Report - U20ah, GIBNE Event; May 17, 1982.

## REFERENCES (Continued)

- O8. Oswald, K. M. (LLNL); Memo to J. Toman, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U4aj, MONTEREY Event; August 25, 1982.
- O9. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2dz, BANON Event; (U) December 5, 1980. Document Classification [SRD]
- OA. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Final Report - U2et, CHEEDAM Event; (U) May 28, 1986. Document Classification [CFRD]
- OB. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Final Report - U9cs, ARMADA Event; (U) May 19, 1986. Document Classification [CFRD]
- OC. Oswald, K. M. (LLNL); Memo to J. Toman, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U2fe, CROWDIE Event; June 16, 1983.
- OD. Oswald, K. M. (LLNL); Memo to J. Toman, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U2ff, LABAN Event; September 12, 1983.
- OE. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2el, MARSILLY Event; (U) November 12, 1982. Document Classification [CFRD]
- OF. Oswald, K. M. (LLNL); Memo to R. H. Ide, LLNL, Subject: Health & Safety Final Report - U2ex, ROMANO Event; (U) September 25, 1987. Document Classification [CFRD]
- OG. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U2ev, AGRINI Event; December 21, 1984.
- OH. Moran, M. T. (LLNL); Memo to L. R. Draper, LLNL, Subject: Health & Safety Final Report - U4ar, BRETON Event; (U) January 11, 1988. Document Classification [CFRD]
- OI. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U20ai, JEFFERSON Event; May 16, 1986.
- OJ. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U2qb, PANAMINT Event; May 30, 1986.
- OK. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U20as, BELMONT Event; October 27, 1986.
- OL. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Postshot Drilling Report - U20ap, BODIE Event; January 9, 1987.
- OM. Raschke, K. E. (LLNL); Memo to Distribution, LLNL, Subject: Radioactive Seep at BODIE - U20ap; September 23, 1987.
- ON. Moran, M. T. (LLNL); Memo to J. C. Behne, LLNL, Subject: Health & Safety Postshot Drilling Report - U2ge, BORATE Event; November 11, 1987.
- OO. Evarts, R. B. (LLNL); Memo to C. Olsen, LLNL, Subject: Revised Summary of AGRINI Release Calculations; November 20, 1984.

## REFERENCES (Continued)

- OP. Smale, R. F. (LLNL); Letter to C. R. Schoengold, REECo; Subject: Reference Documents to Substantiate Effluent Release Data for LANL Events; June 1, 1989.
- OQ. Dummer, J. E. (LANL); Memo to T. T. Scolman, LANL, Subject: Activity Released from BOUSCHET (U3LA)--Final Report; July 12, 1982.
- OR. Smale, R. F. (LANL); Memo to T. T. Scolman, LANL, Subject: Activity Released from PANCHUELA (U3MG)--Final Report; August 4, 1987.
- OS. Smale, R. F. (LANL); Memo to T. T. Scolman, LANL, Subject: Activity Released from LOCKNEY (U19AQ)--Final Report; March 2, 1988.
- OT. NVO-CP-1; Twx to Dir OMA USDOE et. al., Subject: D-Day Post Test Report for BORATE; October 23, 1987.
- OU. NVO-CP-1; Twx to Dir OMA USDOE et. al., Subject: D-Day Post Test Report for SCHELLBOURNE; May 13, 1988.
- OV. NVO-CP-1; Twx to Dir OMA USDOE et. al., Subject: D-Day Post Test Report for BULLFROG; August 30, 1988.
- OW. Oswald, K. M. (LLNL); Memo to R. H. Ide, et. al., LLNL, Subject: Health & Safety Final Report - U8k, VIDE Event; (U) January 29, 1985. Document Classification [CFRD]
- OX. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2ai, DRILL Event; (U) January 8, 1965. Document Classification [SFRD]
- OY. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SAZERAC Release; November 21, 1967.
- OZ. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SCREAMER Release; November 10, 1965.
- PA. DoD/LASL; "The RED HOT Stemming Failure" (Deleted); July 21, 1966.\*
- PB. Murphey, B. F. (SC); Letter to W. W. Allaire, AEC/NVOO, Subject: Scientific Advisor's Report on PIN STRIPE; May 19, 1966.\*
- Q0. Moran, M. T. (LLNL); Memo to L. R. Draper, LLNL, Subject: Health & Safety Final Report - U10be, ORKNEY Event; (U) October 23, 1987. Document Classification [CFRD]
- Q1. Oswald, K. M. (LLNL); Memo to J. Toman and D. D. Simms, LLNL, Subject: Health & Safety Postshot Drilling Report U10be, ORKNEY Event; May 11, 1984.
- Q2. Smale, R. F. (LANL); Memo to T. T. Scolman, LANL, Subject: Activity Released from ABO (U3MC)--Final Report; December 4, 1985.
- Q3. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U2bz, WALLER Event; (U) March 12, 1979. Document Classification [CFRD]

## REFERENCES (Continued)

- QA. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Interim Report - U10m, REO Event; (U) March 30, 1966. Document Classification [CFRD]
- QB. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2bm, LEXINGTON Event; (U) November 14, 1967. Document Classification [CFRD]
- QC. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10ai, POLKA Event; (U) January 16, 1968. Document Classification [CFRD]
- QD. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U10am TUN Event; (U) March 11, 1970. Document Classification [CFRD]
- QE. King, W. C. (LRL); Memo to P. E. Coyle and F. O. Beane, UC/LRL, Subject: Health & Safety Final Report - SCREE Event (deleted) (U); January 12, 1971. Document Classification [CFRD]
- QF. King, W. C. (LLL); Memo to F. O. Beane and R. H. Ide, LLL, Subject: Health & Safety Final Report - U9ci, ARSENATE Event; (U) May 4, 1973. Document Classification [CNSI]
- QI. Smale, R. F. (LANL); Letter to C. R. Schoengold, REECo, Subject: Documentation on Unannounced LANL Events; June 1, 1989.
- QJ. Oswald, K. M. (LLL); Memo to D. C. Oakley and R. S. Guido, LLL, Subject: Health & Safety Final Report - U2ea, SEAFOAM Event; July 10, 1978.
- QK. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U10as, PINEDROPS Event; (U) March 21, 1979. Document Classification [CFRD]
- QL. Oswald, K. M. (LLL); Memo to D. C. Oakley and R. S. Guido, LLL, Subject: Health & Safety Final Report - U2bx, HULSEA Event; (U) July 10, 1978. Document classified.
- QM. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U2ds, GROVE Event; (U) March 12, 1979. Document Classification [CFRD]
- QN. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U2dw, CRESTLAKE Event; (U) October 25, 1979. Document Classification [SRD]
- QO. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U4aa, TRUMBULL Event; (U) February 28, 1979. Document Classification [SRD]
- QP. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U4ab, TEMESCAL Event; (U) September 11, 1981. Document Classification [SRD]
- QQ. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U10bb, PORTOLA Event; (U) December 12, 1980. Document Classification [CFRD]

## REFERENCES (Continued)

- QR. Dummer, J. E. (LASL); Memo to J. C. Hopkins, LASL, Subject: Activity Released from BILGE (U3kc)--Final Report; May 12, 1975.
- QS. Dummer, J. E. (LASL); Memo to J. C. Hopkins, LASL, Subject: Activity Released from SHALLOWS (U3jf)--Final Report; May 19, 1976.
- QT. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U2eg, RIVOLI Event; (U) May 4, 1979. Document Classification [CFRD]
- QU. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U10ba, DOFINO Event; (U) December 12, 1980. Document Classification [CFRD]
- QV. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U4af, CARNELIAN Event; (U) April 9, 1982. Document Classification [SRD]
- QW. Oswald, K. M. (LLL); Memo to J. Toman, LLL, Subject: Health & Safety Final Report - U9cg, GRUYERE Event (deleted); (U) March 12, 1979. Document Classification [CFRD]
- QX. Oswald, K. M. (LLL); Memo to D. C. Oakley and R. S. Guido, LLL, Subject: Health & Safety Drilling Report - U9cg, GRUYERE Event; (U) September 13, 1979. Document Classification [CNSI]
- QY. Oswald, K. M. (LLNL); Memo to J. Toman, LLNL, Subject: Health & Safety Final Report - U2ao, FLOTOST Event; (U) December 1, 1982. Document Classification [CFRD]
- QZ. Oswald, K. M. (LLNL); Memo to R. W. Kuckuck and R. H. Ide, LLNL, Subject: Health & Safety Final Report - U4ah, KARAB Event; (U) October 23, 1984. Document Classification [CFRD]
- RA. Haynie, J. S. (LASL); "Effluent Release Report Sheet for BERNAL Event"; February 5, 1975.
- RB. Haynie, J. S. (LASL); "Effluent Release Report Sheet for ESCABOSA Event"; February 5, 1975.
- RC. Haynie, J. S. (LASL); "Effluent Release (Drillback) Report Sheets for PUYE Event"; February 5, 1975.
- RD. Haynie, J. S. (LASL); "Effluent Release (Cementback) Report Sheet for PUYE Event"; February 5, 1975.
- RE. Haynie, J. S. (LASL); "Effluent Release Report Sheet for BILLET Event"; January 27, 1977.
- RF. Haynie, J. S. (LASL); "Effluent Release Report Sheet for BOBSTAY Event"; February 15, 1978.
- RG. Oswald, K. M. (LLNL); "Effluent Release Report Sheets for TARKO Event"; March 2, 1981.

## REFERENCES (Continued)

- RH. Smale, R. F. (LANL); "Effluent Release Report Sheet for FLORA Event"; January 13, 1981.
- RI. Smale, R. F. (LANL); "Effluent Release Report Sheet for VERDELLO Event"; January 13, 1981.
- RJ. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for RIOLA Event"; March 18, 1982.
- RK. Metcalf, J. H. (SNL); "Effluent Release Report Sheet for MINERS IRON Event"; February 11, 1981.
- RL. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for VIDE Event"; March 18, 1982.
- RM. Oswald, K. M. (LLNL); "Effluent Release Report Sheets for ISLAY Event"; March 22, 1982.
- RN. Smale, R. F. (LANL); "Effluent Release Report Sheet for TREBBINO Event"; February 28, 1982.
- RO. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for CABOC Event"; March 22, 1982.
- RP. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for GIBNE Event"; March 24, 1983.
- RQ. Smale, R. F. (LANL); "Effluent Release Report Sheet for BOUSCHET Event"; February 25, 1983.
- RS. Metcalf, J. H. (SNL); "Effluent Release Report Sheet for HURON LANDING Event"; January 21, 1983.
- RT. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for FRISCO Event"; March 24, 1983.
- RU. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for CHEEDAM Event"; March 9, 1984.
- RV. Smale, R. F. (LANL); "Effluent Release Report Sheet for TURQUOISE Event"; January 9, 1984.
- RW. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for ARMADA Event"; March 9, 1984.
- RX. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for CROWDIE Event"; March 9, 1984.
- RY. Metcalf, J. H. (SNL); "Effluent Release Report Sheet for MINI JADE Event"; March 22, 1984.

## REFERENCES (Continued)

- RZ. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for DANABLU Event"; March 9, 1984.
- S0. Henderson, R. W. (LANL); Letter to T. Watanabe, EGG/WRO, Subject: Effluent Information (EIS) and Onsite Discharge Information (ODIS) for CY-1991; January 29, 1992.
- S1. Metcalf, J. H. (SNL); Letter to J. B. Hall, DOE/NV/TDB, Subject: Effluent Discharge from DNA Activities at the NTS During Calendar Year 1991; March 9, 1992.
- S2. Metcalf, J. H. (SNL); Letter to D. R. Elle, DOE/NV/EPD, Subject: Effluent Discharge from DNA Activities at the NTS During Calendar Year 1992; March 18, 1992.
- SA. Oswald, K. M. (LLNL); "Effluent Release Report Sheets for LABAN Event"; March 9, 1984.
- SB. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for ROMANO Event"; March 9, 1984.
- SC. Raschke, K. E. (LLNL); "Effluent Release Report Sheets for GORBEA Event"; March 18, 1985.
- SD. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for AGRINI Event"; March 18, 1985.
- SE. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for TIERRA Event"; February 6, 1986.
- SF. Buchanan, R. B. (LASL); "Effluent Release Report Sheet for VAUGHN Event"; February 5, 1986.
- SG. Metcalf, J. H. (SNL); "Effluent Release Report Sheet for MISTY RAIN Event"; February 11, 1986.
- SH. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for SALUT Event"; February 6, 1986.
- SI. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for VILLE Event"; February 6, 1986.
- SJ. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for MARIBO Event"; February 6, 1986.
- SK. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for SERENA Event"; February 6, 1986.
- SL. Metcalf, J. H. (SNL); "Effluent Release Report Sheet for MILL YARD and DIAMOND BEECH Events"; February 10, 1986.

## REFERENCES (Continued)

- SM. Smale, R. F. (LANL); "Effluent Release Report Sheet for GLENCOE Event"; January 8, 1987.
- SN. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for JEFFERSON Event"; March 7, 1987.
- SO. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for PANAMINT Event"; March 7, 1987.
- SP. Smale, R. F. (LANL); "Effluent Release Report Sheet for CYBAR Event"; January 8, 1987.
- SQ. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for BELMONT Event"; March 4, 1987.
- SR. Oswald, K. M. (LLNL); "Effluent Release Report Sheet for BODIE Event"; March 4, 1987.
- SS. Raschke, K. E. (LLNL); "Effluent Release Report Sheets for BRETON Event"; March 18, 1985.
- ST. Smale, R. F. (LASL); Memo to R. H. Campbell, LASL, Subject: Effluent Data Package (Enclosure: Synopsis of Effluent Releases Reported to NVO CY-1971 through CY-1974); June 15, 1976.
- SU. Dummer, J. E. (LASL); Memo to T. T. Scolman, LASL, Subject: Effluent Releases at NTS CY-1977; February 8, 1978.
- SV. Smale, R. F. (LANL); Memo to T. T. Scolman, LANL, Subject: NTS Effluent Releases Calendar Year 1986.
- SW. Dummer, J. E. (LASL); Memo to T. T. Scolman, LASL, Subject: Effluent Releases at NTS FY-1978; March 29, 1979.
- SX. Dummer, J. E. (LASL); Letter to J. D. Stewart, ERDA/OSD, Subject: Effluent Data Sheets; February 6, 1975.
- SY. Dummer, J. E. (LASL); Memo to T. T. Scolman, LASL, Subject: Effluent Releases at NTS CY-1976; January 24, 1977.
- SZ. Dummer, J. E. (LASL); Letter to P. J. Mudra, AEC/OSD, Subject: Effluent Data Sheets; February 27, 1974.
- T0. Metcalf, J. H. (SNL); Letter to D. R. Elle, DOE/NV/ESTB, Subject: Effluent Discharge from DNA Activities at the NTS During Calendar Year 1989; February 15, 1990.
- T1. Moran, M. T. (LLNL); Letter to J. B. Hall, DOE/NV/EPD, Subject: Annual Summary for Liquid and Airborne Radioactive Effluent; March 16, 1990.
- T2. Raschke, K. E. (LLNL); Memo to M. T. Moran, LLNL, Subject: U4at Postshot Drilling Operations Release; June 7, 1989.

## REFERENCES (Continued)

- T3. Raschke, K. E. (LLNL); Memo to Distribution, LLNL, Subject: Radioactive Seep at BARNWELL - U20az; August 23, 1990.
- T4. Oswald, K. M. (LLNL); Memo to R. H. Ide/J. C. Behne, LLNL, Subject: Health & Safety Postshot Drilling and Gas Sampling Report - U4q, CAPROCK (LANL); August 14, 1984.
- T5. Raschke, K. E. (LLNL); Memo to Distribution, LLNL, Subject: LABQUARK Radioactive Seep; November 23, 1987.
- T6. Moran, M. T. (LLNL); Letter to J. B. Hall, DOE/NV/EPD, Subject: Annual Summary for Liquid and Airborne Radioactive Effluent; January 17, 1991.
- T7. Henderson, R. W. (LANL); Letter to T. Watanabe, EGG/WRO, Subject: Effluent Information (EIS) and Onsite Discharge Information (ODIS) for CY-1990; February 26, 1991.
- T8. Metcalf, J. H. (SNL); Letter to J. B. Hall, DOE/NV/EPD, Subject: Effluent Discharge from DNA Activities at the NTS During Calendar Year 1990; March 6, 1991.
- T9. Henderson, R. W. (LANL); Letter to V. C. Randall, EGG/ETS, Subject: Effluent Information (EIS) and Onsite Discharge Information (ODIS) for CY-1992; February 18, 1993.
- TA. Dummer, J. E. (LASL); Memo to T. T. Scolman, LASL, Subject: Effluent Releases at NTS CY-1975; February 23, 1976.
- TB. Dummer, J. E. (LASL); Letter to P. Dunaway, ERDA/BSD, Subject: Effluent Data Sheets; February 19, 1976.
- TC. Haynie, J. S. (LASL); Memo to File - Cementback Evaluations, NTS, LASL, Subject: Summary of 1st Quarter 1976 Cementbacks; March 30, 1976.
- TD. Valentine, A. M. (LANL); Letter to P. K. Fitzsimmons, DOE/NV/HPD, Subject: Effluent Data Sheets; February 5, 1986.
- TE. Dummer, J. E. (LASL); Letter to P. Dunaway, ERDA/BSD, Subject: Effluent Data Sheets; January 24, 1977.
- TF. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for PANAMINT Event"; January 7, 1988.
- TG. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for CORNUCOPIA Event"; January 7, 1988.
- TH. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for BELMONT Event"; January 7, 1988.
- TI. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for GASCON Event"; January 7, 1988.

## REFERENCES (Continued)

- TJ. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for BODIE Event"; January 7, 1988.
- TK. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for HAZEBROOK Event"; January 7, 1988.
- TL. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for HARDIN Event"; January 7, 1988.
- TM. Metcalf, J. H. (SNL); "Effluent Release Report Sheet for MISSION GHOST Event"; February 5, 1988.
- TN. Smale, R. F. (LANL); Memo to T. T. Scolman, LANL, Subject: NTS Effluent Releases, Calendar Year 1987; January 25, 1988.
- TO. Smale, R. F. (LANL); "Effluent Release Report Sheet for PANCHUELA Event"; January 20, 1988.
- TP. Smale, R. F. (LANL); "Effluent Release Report Sheet for LOCKNEY Event"; January 20, 1988.
- TQ. Raschke, K. E. (LLNL); "Effluent Release Report Sheet for BORATE Event"; January 7, 1988.
- TR. Moran, M. T. (LLNL); Letter to P. K. Fitzsimmons, DOE/NV/HPD, Subject: Annual Summary for Liquid and Airborne Radioactive Effluent; January 18, 1989.
- TS. Jordan, H. S. (LASL); Memo to R. W. Newman, LASL, Subject: BARSAC (U3gc) Air Sampler Results - Intermediate Report; March 25, 1969.
- TT. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: BLENTON Release; July 23, 1969.
- TU. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: BRONZE Release; September 9, 1965.
- TV. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Revision to CANVASBACK Release Letter JR:N-393; December 1, 1964.
- TW. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2ad, CASHMERE Event; (U) February 26, 1965. Document Classification [CFRD]
- TX. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: CERISE Release; December 12, 1966.
- TY. Olsen, J. L. (LRL); Letter to J.E. Reeves, AEC/NVOO, Subject: Venting of CLEARWATER Event During Drillback Operations; November 19, 1963.
- TZ. Tucker, G. E. (SL); Memo to Distribution, Subject: Effluent Release Report for U16a.05 - DIAMOND DUST; October 1, 1970.

## REFERENCES (Continued)

- U0. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Report - U9ITS CREAM Event (deleted) (U); May 18, 1971. Document Classification [CFRD]
- U1. Rich, B. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U9au, BOGEY Event; (U) April 30, 1964. Document Classification [C]
- U2. King, W. C. (LLL); Memo to P. E. Coyle, LLL, Subject: Health & Safety Final Report - U10aq, BRACKEN Event; (U) October 6, 1971. Document Classification [CFRD]
- U3. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: BRUSH Event; (U) April 26, 1968. Document Classification [C]
- U4. Rich, B. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U9bb, BUNKER Event; (U) February 21, 1964. Document Classification [CFRD]
- U5. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2bn, CHATTY Event; (U) July 15, 1969. Document Classification [CFRD]
- U6. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bg, CHENILLE Event; (U) May 25, 1965. Document Classification [CFRD]
- U7. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U2aa, CLUB Event; (U) May 15, 1964. Document Classification [CFRD]
- U8. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10ak, CROCK Event; (U) June 26, 1968. Document Classification [CFRD]
- U9. Beane, F. O. (LLL); Memo to F. D. Cluff, LLL, Subject: Post-Shot Gas Sampling Operations for the DIANTHUS Event; (U) June 8, 1972. Document Classification [CRD]
- UA. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U10ag, WORTH Event; (U) November 30, 1967. Document Classification [CFRD]
- UB. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U2ar, DRIVER Event; (U) May 21, 1964. Document Classification [CFRD]
- UC. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U10ds, DUFFER Event; (U) July 6, 1964. Document Classification [CFRD]
- UD. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U9ap, RACK Event; (U) September 30, 1968. Document Classification [CFRD]
- UE. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10z, RIVET II Event; (U) April 3, 1967. Document Classification [CFRD]
- UF. King, W. C. (LLL); Memo to F. O. Beane, LLL, Subject: Health & Safety Final Report - U2dh, SAPHO Event (deleted) (U); August 11, 1972. Document Classification [CFRD]

## REFERENCES (Continued)

- UG. Scolman, T. T. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SEAWEEED "C", "D", and "E" Events Release (U); January 14, 1970. Document Classification [SNSI]
- UH. Scolman, T. T. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SEAWEEED "B" Release (U); January 14, 1970. Document Classification [CNSI]
- UI. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bm, SEERSUCKER Event (U); March 15, 1965. Document Classification [CFRD]
- UJ. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SEVILLA Release (U); July 31, 1968. Document Classification [CNSI]
- UK. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SIDECAR Release (U); January 10, 1967. Document Classification [CFRD]
- UL. Campbell, R. H. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: SIENNA Release (U); February 14, 1966. Document Classification [CFRD]
- UM. Oswald, K. M. (LLL); Memo to F. O. Beane, LLL, Subject: Health & Safety Final Report - U9w-24.5, SOLANUM Event (U); August 31, 1973. Document Classification [SRD]
- UN. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Preliminary Data Radioactivity Release SOLENDON Event (U); February 18, 1964. Document Classification [CFRD]
- UO. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bd, SPOON Event (U); October 12, 1964. Document Classification [CFRD]
- UP. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bk, SUEDE Event (U); May 6, 1965. Document Classification [CFRD]
- UQ. King, W. C. (LRL); Letter to O. H. Roehlk, AEC/NVO/OSD, Subject: Interim Report, NARRAGAUGUS Event (U); October 29, 1963. Document Classification [CFRD]
- UR. Rich, B. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U9ba, HANDICAP Event (U); April 1, 1964. Document Classification [CFRD]
- US. Rich, B. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U9bc, HOOK Event (U); April 24, 1964. Document Classification [CFRD]
- UT. Rich, B. L. (LRL); Letter to R. H. Thalgott, AEC/NVOO, Subject: Interim Report - U9ax, GREYS Event (U); April 30, 1964. Document Classification [CFRD]
- UU. Rich, B. L. (LRL); Memo to J. L. Olsen, UC/LRL, Subject: Interim Report - U9bf, LINKS Event (U); August 11, 1964. Document Classification [CFRD]
- UV. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2ay-1, - 2, - 3, YANNIGAN Event (Deleted); August 7, 1970.

## REFERENCES (Continued)

- UW. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bo, ORGANDY Event (U); July 26, 1965. Document Classification [CFRD]
- UX. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2ah, PONGEE Event (U); August 24, 1965. Document Classification [CFRD]
- UY. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U9bp, IZZER Event (U); September 8, 1965. Document Classification [CFRD]
- UZ. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2be, NOOR and U2bg, THROW Events (U); June 4, 1968. Document Classification [CFRD]
- V0. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2bj, TICKING Event (U); October 4, 1965. Document Classification [CFRD]
- V1. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Interim Report - U2c, KERMIT Event (U); December 14, 1965. Document Classification [CFRD]
- V2. Rich, B. L. (LRL); Memo to W. R. Woodruff, UC/LRL, Subject: Health & Safety Final Report - U2ah, PONGEE Event (U); February 4, 1966. Document Classification [CFRD]
- V3. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U10ad, VIGIL Event (U); February 15, 1967. Document Classification [CFRD]
- V4. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: MUSHROOM Release (U); March 29, 1967. Document Classification [CNSI]
- V5. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2bi, OAKLAND Event (U); May 26, 1967. Document Classification [CFRD]
- V6. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Interim Report - U2cg, HEILMAN Event (U); June 13, 1967. Document Classification [CFRD]
- V7. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: GILROY Release (U); September 27, 1967. Document Classification [CNSI]
- V8. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: FUNNEL Release (U); August 26, 1968. Document Classification [CNSI]
- V9. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U2bj, IMP Event (U); November 4, 1968. Document Classification [CFRD]
- VA. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U9bu, HULA Event (U); January 15, 1969. Document Classification [CFRD]
- VB. King, W. C. (LRL); Memo to C. E. Williams, UC/LRL, Subject: Health & Safety Final Report - U9by, VALISE Event (U); April 8, 1969. Document Classification [CNSI]

## REFERENCES (Continued)

- VC. Newman, R. W. (LASL); Letter to R. H. Thalgott, AEC/NVOO, Subject: IPECAC "A" and IPECAC "B" Release (Deleted) (U); July 11, 1969. Document Classification [CNSI]
- VD. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U2bq, 1-2, KYACK Event (Deleted) (U); December 4, 1969. Document Classification [CFRD]
- VE. King, W. C. (LRL); Memo to P. E. Coyle, UC/LRL, Subject: Health & Safety Final Report - U9ITS, AA-25, X-27, and Y-30, PITON Event (Deleted) (U); August 13, 1970. Document Classification [CFRD]
- VF. King, W. C. (LLL); Memo to F. O. Beane, LLL, Subject: Health & Safety Final Report - U2dh #3, KARA Event (U); August 14, 1972. Document Classification [CFRD]
- VG. King, W. C. (LLL); Memo to F. O. Beane, LLL, Subject: Health & Safety Final Report - U2dn, MERIDA Event (U); August 18, 1972. Document Classification [CFRD]
- VH. Oswald, K. M. (LLL); Memo to F. O. Beane et. al., LLL, Subject: Health & Safety Final Report - U2do, GAZOOK Event (U); November 7, 1973. Document Classification [CFRD]
- VI. Oswald, K. M. (LLL); Memo to F. O. Beane et. al., LLL, Subject: Health & Safety Final Report - U10av, KASHAN Event (U); May 29, 1974. Document Classification [CFRD]
- VJ. Lesses, E. D. (LLNL); Memo to M. T. Moran, LLNL, Subject: Postshot Ventline Release - SCHELLBOURNE, U2gf; June 7, 1988.
- VK. Lesses, E. D. (LLNL); Memo to M. T. Moran, LLNL, Subject: Postshot Ventline Release - BULLFROG, U4au; September 12, 1988.

## GLOSSARY

Activity	The rate of decay of radioactive material expressed as the number of nuclear disintegrations per second (See curie).
Background Radiation	Radiation arising from radioactive material other than the one directly under consideration. Background radiation due to cosmic rays and natural radioactivity is always present.
Beta Particle	Charged particle emitted from the nucleus of an atom as part of the decay process, with a mass and charge equal in magnitude to that of the electron.
Cementback	Operation whereby the drill hole is sealed with a plug and cemented to the surface.
Controlled Release	A planned, filtered release frequently performed to reduce airborne radiation levels in the working environment.
Cable Pull	Recovery of a cable placed near a nuclear explosion. The cable ran to the surface and was pulled free shortly after zero time. The debris captured on the bottom end of the cable was analyzed to assess device performance.
Catcher Pull	Recovery of a debris catcher, placed near a nuclear explosive, by pulling on the attached cable and thus returning the catcher to the ground surface. This operation is usually accomplished within minutes to hours of zero time.
Crater	A nuclear device placed shallow enough underground to produce a throw-out of earth when exploded.
Curie (Ci)	A unit of activity where 1 curie is defined as $3.7 \times 10^{10}$ disintegrations per second.
Detonation	A single nuclear device explosion; one or more comprise a test.
Drillback	Directional drilling operation, performed after the test activities have ceased, to sample fission product materials in the test cavity.
Exposure Rate	A measure of the ionization produced in air by x or gamma radiation per unit of time (frequently expressed in R/hr or mR/hr).
Gamma	High energy electromagnetic radiations produced during the disintegration of radioactive elements.
Gas Sampling	Operation usually performed after test activities have ceased to determine levels of noble gases present.
Gross Beta	Measure of the total beta activity.
H Hour	Detonation time (zero hour), the time the device was detonated.

## GLOSSARY (Continued)

Intermediate	The nomenclature for test yields varied according to information policy governing specific years. From 1945 through 1963, "Intermediate" referred to test yields from 20 to 200 kt.
Isotopes	Forms of the same element having the same number of protons, but different numbers of neutrons.
Joint US-UK	A nuclear test conducted jointly by the United States and the United Kingdom under a cooperative agreement in effect between the two countries since August 4, 1958.
kt	A kiloton. The energy of a nuclear explosion that is equivalent to an explosion of 1,000 tons of TNT.
Late-Time Seepage	A slow release of gases from test detonation sites, that could exist from a few hours to even weeks after all other operations in the area have ceased (as defined for the purpose of this report).
Low	The nomenclature for test yields varied according to information policy governing specific years. From 1945 through 1963, "Low" referred to test yields less than 20 kt.
Milliroentgen (mR)	One-thousandth of a roentgen.
Offsite	The detection of radioactivity offsite is defined as detected outside the Test Range Complex, an area that includes both the Nevada Test Site and the adjacent government-controlled Nellis Air Force Range.
Onsite	A notation that radioactivity was detected onsite only is made for tests from which there was a release of radioactivity into the atmosphere that was not detected beyond the boundaries of the Test Range Complex.
Picocurie	$1 \times 10^{-12}$ curie.
Plowshare	Application of nuclear explosives to develop peaceful uses for atomic energy. The program is no longer active.
Radiation	The emission and propagation of energy through space or through a material medium in the form of waves and/or particles. Only alpha, beta, gamma, x-ray, and neutron emissions resulting from nuclear detonations and detonation products are intended herein.
Radioactivity	The property of unstable nuclei of atoms of emitting particles or rays in the process of becoming stable.
Roentgen (R)	A special unit of exposure to ionizing radiation. It is that amount of gamma or x rays required to produce one electrostatic unit of charge of either sign per cubic centimeter of air at standard temperature and pressure.

## GLOSSARY (Continued)

Safety Experiment	Experiment designed to confirm a nuclear explosion will not occur in case of an accidental detonation of the explosive associated with the device.
Shaft	A nuclear device exploded at the bottom of a drilled or mined vertical hole.
Storage-Transportation	Detonations of combinations of high explosives and nuclear materials designed to study distribution of nuclear material during accidents in several transportation and storage configurations.
Surface	A nuclear device placed on or close to the earth's surface.
Test	A test is defined in the Threshold Test Ban Treaty as either a single underground nuclear explosion conducted at a test site, or two or more underground nuclear explosions conducted within an area delineated by a circle having a diameter of two kilometers and conducted within a total period of time not to exceed 0.1 second.
Test Range Complex	An area that includes both the Nevada Test Site and the adjacent government-controlled Nellis Air Force Range.
Tunnel	A nuclear device exploded at the end of a long horizontal drift mined into a mountain or mesa in a way that places the burst point deep within the earth.
Uncontrolled Release	A spontaneous release occurring after a test, but before postshot drilling operations commence. For this report, this term is used when referring to tunnel tests.
Underground (UG)	Underground nuclear test conducted in a tunnel or at the bottom of a drilled hole or shaft. Some underground nuclear tests were not designed to contain all radioactivity; e.g., cratering tests or safety experiments.
Vela Uniform	Department of Defense program designed to improve the capability to detect, identify, and locate underground nuclear explosions.
Vent Line	Ventilation tubing, either steel or plastic, that is used to conduct the air into or out of the underground excavations and through the fans.
Venting	A rapid release of gaseous and particulate matter into the atmosphere, usually within minutes of an underground explosion.
Weapons Effects	A nuclear test to evaluate the civil or military effects of a nuclear detonation on various targets, such as military hardware.
Weapons Related	A nuclear detonation conducted for the purpose of testing a nuclear device intended for a specific type of weapon system.

## **GLOSSARY (Continued)**

Yield

The total effective energy released in a nuclear explosion. It is usually expressed in terms of equivalent tonnage of TNT required to produce the same energy release in an explosion.

## ACRONYMS

ARPA	Advanced Research Projects Agency
DNA	Defense Nuclear Agency, an organization within DoD
DoD	Department of Defense
EPA	Environmental Protection Agency, established in December 1970
LANL	Los Alamos National Laboratory. U.S. Government laboratory located in Los Alamos, New Mexico
LASL	Los Alamos Scientific Laboratory, became LANL on January 1, 1981
LLL	Lawrence Livermore Laboratory, became LLNL on February 29, 1980
LLNL	Lawrence Livermore National Laboratory. U.S. Government Laboratory located in Livermore, California
LRL	Lawrence Radiation Laboratory, became LLL in July 1971
NAFR	Nellis Air Force Range
NTS	Nevada Test Site. A 1,350-square-mile area in Nye County, Nevada, located about 65 miles northwest of Las Vegas
PHS	U.S. Public Health Service, whose radiation monitoring functions were taken over by the EPA in 1970
REECo	Reynolds Electrical & Engineering Company, Incorporated
SC	Sandia Corporation, became SL on July 31, 1970
SL	Sandia Laboratory, became SNL on February 29, 1980
SNL	Sandia National Laboratories, U.S. Government laboratories located in Albuquerque, New Mexico and Livermore, California
UK	United Kingdom